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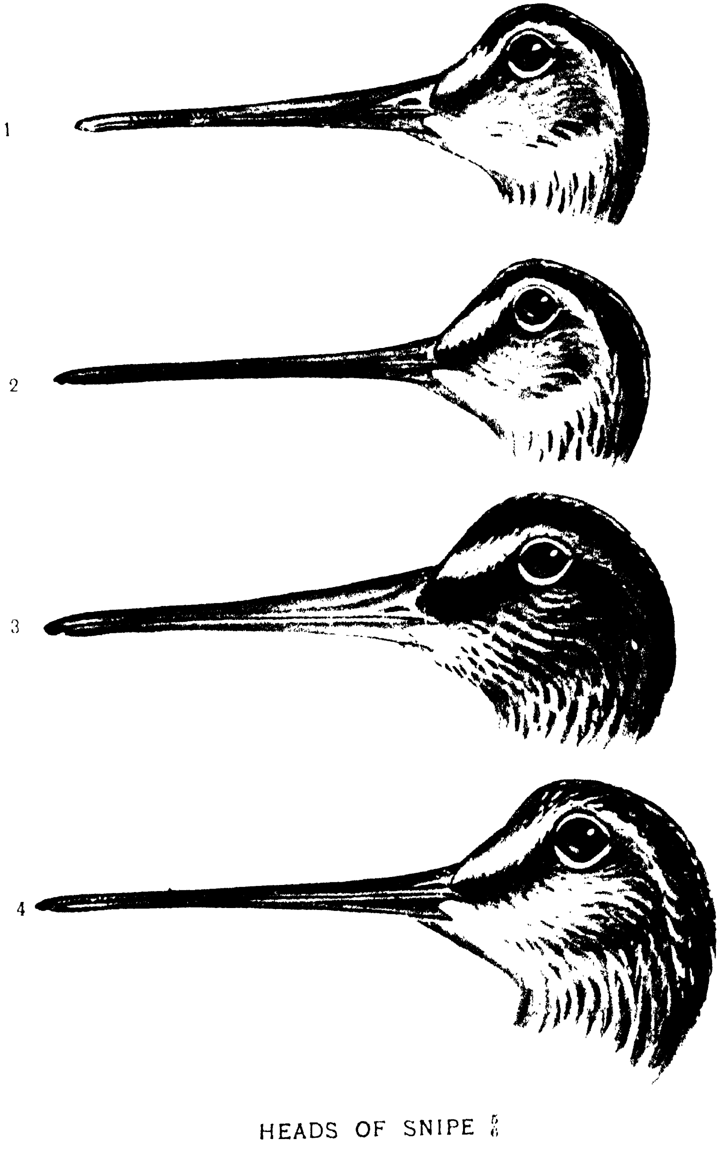

HEADS OF SNIPE $\frac{5}{6}$

(1) *Capella stenura.* (2) *Capella g. gallinago.*
(3) *Capella nemoricola.* (4) *Capella solitaria.*

THE FAUNA OF BRITISH INDIA,

INCLUDING

CEYLON AND BURMA.

Published under the authority of the Secretary of State for India in Council.

EDITED BY E. C. STUART BAKER, O.B.E., F.Z.S., Etc.

BIRDS.—VOL. VI.

(Second Edition.)

BY

E. C. STUART BAKER, O.B.E., F.Z.S., Etc.

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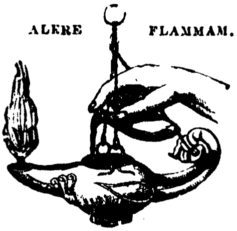
ALERE FLAMMAM.

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PREFACE.

THE present volume completes the enumeration and description of the Birds of British India, whilst corrigenda, addenda and synonomy will be given in a seventh and final volume.

The number of species described by the various authors who have written on the Birds of India since 1864, when Jerdon's first edition appeared, shows what great progress has been made in our studies of the Avifauna. In 1864 Jerdon included in his three volumes 1016 species. It must be remembered, however, that Jerdon dealt with a very much smaller area in his work, as he omitted parts of Assam and Burma. Hume provisionally named 1788 species in his Catalogue of the year 1879, many of which he eventually rejected and 74 of which he regarded as doubtful. This left a total of 1608 species which he considered to be satisfactorily determined, all of which, it should be noted, were regarded as full species. Hume, however, whilst fully appreciating the value of geographical variation in birds, had not passed beyond the binomial system of nomenclature and, therefore, whenever this variation was obvious, the bird was raised to the rank of species, though frequently Hume noted that the differences between it and its nearest allies were racial only.

In the first edition of the Avifauna written by Blanford and Oates in 1898 the area covered was extended to include all Burma and Assam, 1616 species were described and 11 added in an appendix, giving a total of 1627. In this work also subspecies were not recognized as such. Consequently minor differences, however constant and distinct, were again passed over as valueless, whilst those which were greater were considered sufficient to give the geographical race the position of a full species. The present work, in which for the first time subspecies are recognized under the trinomial system of classification, contains 2293 species and subspecies. In many cases, forms which Hume named and then rejected have had to be resuscitated, frequently because they represent definite geographical variations as already shown by him. Thus, although not worthy of the status of a full species because they grade into other forms in connected areas, they yet could not possibly be ignored and must take their proper positions as subspecies.

I have already dealt in some detail with the classification in the present edition when commenting on the characters under the headings of the various orders, suborders and families, and it is therefore unnecessary for me to add much here. Briefly I have acted on the principle that a classification already in use should not be altered for another classification equally good merely for the sake of change. I have, therefore, so far as is possible, followed Blanford and Oates in their classification unless this has been definitely proved to be wrong.

In the volumes dealing with the *Pico-Passeres*, I have been greatly indebted to the work of Mr. W. P. Pycraft, whilst in this, the VIth Volume, I have followed in great part the arrangement of Orders, Families and Genera suggested by Dr. P. R. Lowe as a result of his researches. In regard to the *Charadriiformes*, especially, his system seems to be a distinct advance upon anything previously attempted. In consequence, the reader will find more drastic changes in this great order than have been made in any of the others. Every system, however, is merely the basis for further research work; many of Dr. Lowe's changes are suggestions rather than final opinions, and neither he nor I imagine that his system will not require further alteration and improvement.

It is quite possible that further research work will prove that many anatomical characters, upon which at present great reliability is placed, are of much less value than is believed to be the case, whilst some of these, so-called, deep-seated characters may prove to be of less importance than others which now are considered superficial. One such character which is very obvious is that of colour and colour-pattern, which in my opinion may ultimately prove to be a character of the utmost importance in the definition of genera and perhaps even of families. Oates, in the first edition of the Avifauna, had already recognized the importance of this character, employing it as one of the means of differentiating between the Passerine genera. Dr. Lowe, as well as many other systematists, has also emphasized the value of the plumage-pattern in the young of birds, and this character is now generally accepted as a great aid in determining the position of the parent bird. Oates used the colour of the young as compared with that of the adult as the guiding characteristic in his Passerine families. Further work in museum and field has endorsed his use of this feature but, although Dr. C. B. Ticehurst has already contributed greatly to our knowledge in this respect, it must be remembered that, as regards India, much work yet remains to be done in the study of juvenile and nestling plumage. This is a work in which the field naturalist can do far more than the purely museum systematist. It is therefore to be hoped that those who read the present work will do their utmost to fill the many gaps in this volume which exist in this respect.

Another point to which I would draw the attention of the field naturalist is the fact there are still some three hundred species and subspecies of birds of whose habits and nidification we know nothing. Again, our recorded knowledge of vernacular names is curiously meagre, many naturalists being satisfied to say that Indians have only class names for birds and do not distinguish between allied species. It is true that Indians do so lump many species under one family name, but it will be found that in most cases the various species are recognized and differentiated by the addition of a descriptive prefix. It would be equally true to say that Englishmen do not distinguish one duck from another because they call them all ducks.

The present volume contains the Game-Birds, Pigeons, Bustard-Quails, the immense number of birds generally known as Water-Birds and Waders, together with the Flamingoes, Ducks and their allies, and the Grebes. Even amongst the birds so well known as the Ducks and Geese much yet remains to be learnt in regard to moults, eclipse plumage and various other points in their life-history, whilst it is possible that other species and subspecies occur which have so far been overlooked. I would therefore again emphasize the fact that it is to the field naturalist we must look for the elucidation of many of these questions.

I have to acknowledge the courtesy of the Editors of the 'Bombay Natural History Journal' in allowing me to use the three plates depicting the Bills, Wings and Tails of the Snipes, showing the differences between the various species far better than the most lengthy descriptions.

My work of writing the present volume and the five which have already appeared has been carried out almost entirely at the British Museum, and I would most sincerely thank the authorities in the Bird Room for their unfailing patience, courtesy and help, without which the volumes would have been long delayed. To Dr. P. Lowe and to Mr. N. Kinnear I am indebted for constant help in every way, and to Mr. T. Wells for the infinite patience with which he has endured the endless interruptions I have caused to his normal work.

In conclusion, I would ask my readers to remember that these same volumes have been written during a period in which naturalists have been concentrating on the subdivision of species into geographical races and on corrections in nomenclature. Had I waited to work out as minutely as I could have done such details in the case of every bird described, it is probable that the first volume would be still under preparation. Nomenclature and geographical variations must be the work of many authors and perhaps of several generations, so that complete stability cannot be expected during our days. At the same time, it is hoped that the six volumes will prove a useful basis upon which systematists can build, and it is believed that the comparative speed at which they have been produced will assist in this work more than would have been the case had greater delay brought the volumes some steps nearer perfection. As regards the Field Naturalist, I hope that it will show him how much there is left for him to do and will also prove to him how entirely interdependent the man in the museum and the man in the field are upon one another.

E. C. STUART BAKER.

March 28th, 1929.

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Order VIII. GRALLÆ.

Since the 1st edition of this work was written further research work, especially that by Dr. P. Lowe, has shown that certain modifications are necessary in the classification then adopted. It is, however, still believed that the Rails, Cranes and Bustards are nearer to one another than they are to other groups and should be retained in Blanford's *Grallæ*. The interrelationship of these three groups is very intricate and further modifications may be required when this has been worked out, whilst it has already been shown that the *Jacanæ* must either be removed from the *Limicolæ* or *Lari-Limicolæ* to the present Order, or else to an Order intermediate between the two.

In the *Grallæ* the hind-toe when present is slightly raised except in the *Jacanidæ* and *Rostratulidæ*; the legs are generally long and part of the tibia is bare. All are schizognathous and none possess basypterygoid processes; the vomer is always present and the angle of the mandible is truncated; there are two carotids; nostrils pervious, except in *Rhinochetus*; ambiens muscle always present and cæca generally well developed; the deep flexor tendons are Galline except in *Heliornithidæ*, whilst they are modified in the *Otidæ*.

Key to Suborders.

A. Oil-gland tufted; a hallux present.
  a. Holorhinal; sternum with a single notch on each side .... **Fulicariæ**, p. 1.
  b. Schizorhinal.
    a'. Sternum with two notches on each side.
      a^2. Toes long, claws greatly developed and very long .... **Jacanæ**, p. 39.
      b^2. Toes and claws normal .... **Rostratulæ**, p. 44.
    b'. Sternum without notches .... **Balearicæ**, p. 48.
B. No oil-gland; holorhinal, sternum with two notches on each side; no hallux .... **Otides**, p. 59

Suborder **FULICARIÆ.**

Schizognathous and holorhinal birds with heterocœlous vertebræ and 14 or 15 cervical vertebræ. The sternum has a single notch on each side of the posterior margin; oil-gland tufted; cæca well developed; besides the ambiens, the femora-caudal, accessory femoro-caudal and semitendinosus muscles are always present; the accessory semitendinosus is present in the *Rallidæ*, not in *Heliornithidæ*.

Key to Families.

A. Rectrices 10 to 14, usually 12; an aftershaft present .... **Rallidæ**, p. 3.
B. Rectrices 18; no aftershaft .... **Heliornithidæ**, p. 36.

Family RALLIDÆ.

In this family the sternum closely resembles that of *Turnix* and has a similar deep notch on each side. There is a small aftershaft to the contour feathers and the fifth secondary is absent. The Pterylosis shows long lateral bare tracts on the neck. The deep flexor tendons are Galline, *i. e.*, the *flexor longus hallucis* supplies the hallux and the *flexor perforans digitorum* the three other toes, the two tendons being connected by a tendon passing from the first to the second.

The family contains the Rails, Crakes and Coots and these are represented by various species practically throughout the world.

Key to Genera.

A. Bill from gape as long as, or longer than, the tarsus.	
a. Bill slender. No white markings on back	RALLUS, p. 4.
b. Bill stouter. Back marked with white bars or spots	HYPOTÆNIDIA, p. 7.
B. Bill from gape much shorter than tarsus.	
c. No frontal shield.	
a'. Second quill longest; first between fifth and seventh.	
a^2. Tarsus longer than middle toe without claw	CREX, p. 9.
b^2. Tarsus shorter than middle toe without claw	PORZANA, p. 11.
b'. Third to sixth quill longest; first shorter than eighth.	
c^2. Tarsus longer than middle toe without claw. Plumage banded below	RALLINA, p. 15.
d^2. Tarsus shorter than middle toe without claw. Plumage not banded below	AMAURORNIS, p. 19.
d. Upper mandible prolonged to form a shield on forehead.	
c'. No lobate fringe to toes.	
e^2. Plumage not blue; frontal shield not truncated behind.	
a^3. Toes with a narrow straight-edged lateral fringe. Sexes alike	GALLINULA, p. 27.
b^3. Toes without any fringe. Sexes differing	GALLICREX, p. 29.
f^2. Plumage blue; frontal shield truncated behind	PORPHYRIO, p. 31.
d'. Toes with a membranous fringe, divided into convex lobes. Plumage black or blackish-grey	FULICA, p. 33.

Genus RALLUS.

Rallus Linn., Syst. Nat., 10th ed., p. 153, Jan. 1758.

Type, *Rallus aquaticus* Linn.

In this genus the bill is as long as the tarsus or a little longer, straight or slightly curved and compressed; the nostrils are linear and are placed in an elongate groove on each side of the mandible. The wings are short, the second quill usually longest, the first between the sixth and eighth. The tail is short. The tarsus is slender; shorter than the middle toe in the typical species and always shorter than the middle toe and claw; the toes are long, slender and free. The feathers of the forehead bristly.

The genus is almost cosmopolitan and one species is represented in India.

Rallus aquaticus.

Rallus aquaticus Linn., Syst. Nat., 10th ed., p. 153, Jan. 1758.

Type-locality: Great Britain.

The typical form differs from our Indian forms in having the whole breast a much darker purer grey, the pale supercilium is less distinct and the dark brown line through the eye less developed posteriorly.

The inclusion of the Common Water-Rail in the Indian Avifauna rests upon two supposed specimens obtained in the Dun and a third near Abottabad. All three of these, however, seem to me to be *R. a. korejewi*, a race very close to the European bird but averaging paler both above and below.

Key to Subspecies.

A. Darker, both above and below	*R. a. indicus*, p. 4.
B. Paler, both above and below	*R. a. korejewi*, p. 6.

(2006) Rallus aquaticus indicus.

THE INDIAN WATER-RAIL.

Rallus indicus Blyth, J. A. S. B., xviii, p. 820 (1840) (Bengal); Blanf. & Oates, iv, p. 158 (part.).

Vernacular names. None recorded.

Description. Forehead, crown and nape black with rufescent olive-brown margins; supercilium from the forehead to the ear-coverts white above the lores, ashy posteriorly; lores and a line through the eye dark ashy-brown; upper plumage, scapulars, inner secondaries and tail black with broad olive-brown edges; lesser and median wing-coverts olive-brown, with traces of white bars and tips; greater and primary coverts olive-brown, sometimes with faint traces of white bars, sometimes with none at all; quills brown; cheeks and sides of head ashy-grey; chin and throat nearly white; fore-neck, breast and abdomen ashy marked with brown; flanks, vent and lower abdomen black or blackish-brown, barred with white; under tail-coverts black edged with rufescent-white.

Colours of soft parts. Iris red-brown to brick-red; bill, upper mandible dark brown, with a stripe on the base bright orange-red to vermilion; base of lower mandible also red but rather paler, the terminal third grey to dark horny-brown; legs and feet fleshy-brown to pink or browny-pink.

Measurements. Total length about 320 mm.; wing, ♂ 120 to 130 mm., ♀ 110 to 122 mm.; tail 52 to 65 mm.; culmen, ♂ 40 to 43 mm., ♀ 36 to 40 mm.; tarsus about 40 to 45 mm.

Chick in down. Velvety-black all over.

Young birds have broader pale rufescent edges to the lower plumage and are much more definitely barred with white on the wing-coverts.

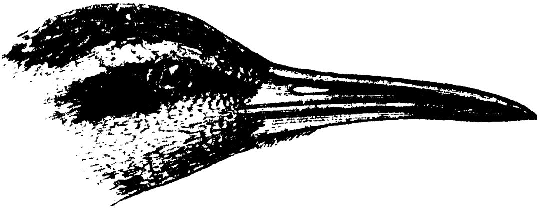

Fig. 1.—Head of *R. a. indicus.* $\frac{1}{1}$.

Distribution. In Winter a migratory bird to Burma, Assam and Eastern Bengal. Nowhere else in India. In Summer North-East China, Eastern Siberia to Japan.

Rallus aquaticus aquaticus differs from our Indian bird in having the whole of the breast etc. a much darker, purer grey; the sides of the head are practically all dark grey and there are only faint indications, if any, of the pale supercilium; the chin is almost as dark a grey as the throat and breast.

Young birds freshly mounted have pale rufescent edges to the feathers of the breast and lower parts but they are never sufficiently conspicuous to make these parts like those of the India Water-Rail.

The inclusion of the European Water-Rail within the limits of the Indian Empire rests upon the two specimens obtained by Dr. King and Dr. Adams in the Dun and a single specimen obtained near Abbotabad, all of which, however, in my opinion belong to the slightly paler form found in Turkestan. Those birds also which have been found breeding in Kashmir are of this same race and the British Museum does not possess a single specimen which can definitely be allocated to the European race.

Nidification. This Little Rail breeds in North-Eastern China, Siberia and Japan in May and early June, making a nest of rushes and weeds placed in rank herbage of almost any kind close to swamps or in wet meadows etc. The eggs are like those of the European Water-Rail but decidedly richer in colour on an an average and in shape broader shorter ovals. The ground is pale cream or buff and the markings consist of small reddish blotches thinly scattered over the larger end with a few underlying of grey and neutral tint. Thirty eggs average 33·7 × 25·9 mm.: maxima **36·0**×26·3 and 35·0×**27·0** mm.; minima **32·2**×**25·1** mm. Alan Ouston says the normal clutch is 6 or 7 eggs, sometimes as few as three or as many as ten.

Habits. The habits of all the races of Water-Rails are similar, great skulkers nearly always hiding in dense grass, weeds or reeds and but seldom venturing into the open. They feed on seeds, shoots of plants, buds etc. and also on insects, small molluscs and especially on grasshoppers and their larvæ. The ordinary note is a softly-repeated "chip, chip chip," the breeding-call and challenge-note a loud, startling scream. On their first appearance in India on migration these birds are often so exhausted as to allow themselves to be captured by hand without attempting to move. Their ordinary walk is like that of a Moor-hen, with similar little jerks of the tail but when disturbed they run with both head and tail depressed and at considerable speed.

(2007) Rallus aquaticus korejewi.

THE TURKESTAN WATER-RAIL.

Rallus aquaticus korejewi Sarudny, Orn. Monatsb., 1905, p. 209 (E. Turkestan).

Rallus aquaticus. Blanf. & Oates, iv, p. 158 (part.).

Vernacular names. None recorded.

Description. Similar to the preceding bird but paler and more grey both above and below. The brown eye-stripe is faint or absent behind the eye.

Colours of soft parts as in the other races.

Measurements. Wing, ♂ 128 to 136 mm., ♀ 116 to 126 mm.

Distribution. Apparently a resident breeding bird in Transcaspia, Turkestan, Persia and the whole of Kashmir to Ladak but not Tibet. In Winter it straggles down to N.W. India, South Sind and as far as Sehore in the Central Provinces.

Nidification. Nests of this Rail were taken by Ward and his collectors in Kashmir and Ladak in June and July, whilst Osmaston found eggs from 1st June to 15th August. It is a common breeding bird in Kashmir but the nests are well concealed and the birds invariably skulk away from them before they can be seen and identified. The nests are made of rushes and dry weeds in thick cover, either in, or close to, swamps and lakes. The eggs, which number six to ten, are not distinguishable from those of the European bird. The ground-colour varies from pale buff to pale grey-green with small blotches of pale reddish scattered over the surface and rather more numerous at the larger end. Forty-eight eggs average 26·9×25·3 mm.: maxima **40·7**×26·0 and 38·4×**27·0** mm.; minima **33·2**×24·0 and 33·5×**23·0** mm.

Habits. Similar to those of the European Water-Rail. This form, however, seems to be less migratory than that bird, for, whilst it is resident throughout the year in the North-West Himalayas, it is but rarely met with in the Plains in Winter.

Genus **HYPOTÆNIDIA.**

Hypotænidia Reichenbach, Nat. Syst. Vögel, xxiii (1852).

Type by orig. desig., *Rallus pectoralis.*

This genus differs from *Rallus* in having a stouter and, often a rather shorter bill, with a more distinctly angulate gonys. Two races of one species, *Hypotænidia striata*, are found in India, whilst outside this country they are widely distributed throughout the Oriental and Australian regions.

Hypotænidia striata.

Rallus striatus Linn., Syst. Nat., 12th ed., i, p. 262.

Type-locality: Philippines.

The typical form is smaller than those found in India and Burma, with a rather shorter, stouter bill.

Key to Subspecies.

A. Paler and rather smaller	*H. s. gularis*, p. 7.
B. Darker and rather larger	*H. s. obscuriora*, p. 9.

(2008) Hypotænidia striata gularis.

THE INDIAN BLUE-BREASTED BANDED RAIL.

Rallus gularis Horsf., Trans. Linn. Soc., xiii, p. 196 (1821) (Java).

Vernacular names. *Kana Koli* (Tam.); *Wadi-koli* (Tel.); *Yaygyet* (Burm.).

Description.—Male. Crown to hind-neck rufous; upper parts dark-brown marked with wavy white bars, broken into spots on the lower back and primaries, each feather edged with olive-brown, much abraded in worn plumage; chin and throat white;

sides of the head, fore-neck and breast ashy-grey; abdomen, flanks, under wing-coverts, axillaries and under tail-coverts dark brown barred with white.

Colours of soft parts. Irides light brown in younger birds to Indian red in old adult breeding birds; upper and tip of lower mandible horny-brown to dark brown, lower mandible and commissure dull yellowish-red to bright red; legs and feet olive-grey, olive or fleshy-grey.

Measurements. Wing 108 to 131 mm.; tail 38 to 41 mm.; tarsus 34 to 37 mm.; culmen 31 to 34 mm.

Females are a trifle duller, the chestnut of the head more inclined to be streaked with blackish and the abdomen paler, more whitish.

Young birds have the feathers of the back streaked with dark brown and the white bars and spots obsolete or absent; the crown and neck are rufous-brown freely streaked with dark brown.

Distribution. The Indian form is found practically throughout Ceylon, India and Burma in suitable localities where there are sufficient marshes and swamps, whilst it extends, as already noted, to South China and Formosa in the East and to Java in the South.

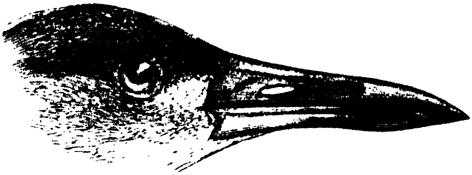

Fig. 2.—Head of *H. s. gularis*. $\frac{1}{1}$.

Nidification. The breeding-season commences as soon as the Rains have well set in and the lakes and swamps begin to fill up. The nest is a well-made, rather massive affair of weeds and rushes often wet and muddy in the lower half but warm and dry in the upper half, in which is a well-marked depression for the eggs. It is most often placed in rank vegetation or reeds in the shallower portions of some swamp but occasionally at some little distance from water. The eggs vary from five to eight in number and are decidedly handsome. The ground-colour varies from creamy-white to a warm salmon-buff. The markings are of two characters: in the one they consist of sparsely-scattered blotches and spots of rich reddish-brown with underlying marks of neutral tint; in the other longitudinal specks and small blotches of pale reddish are numerously distributed over the whole surface. Two hundred eggs average 33·7×25·8 mm.: maxima 36·6×28·6 and 36·3×28·8 mm.; minima 30·6×25·0 and 33·9×23·9 mm.

Habits. This is one of the most familiar Indian Water-birds and may be found in almost every village pond as well as in the remoter lakes. They are very tame and confiding, walking about over the weeds with slow deliberate steps, the tail jerked with each step, taking but little notice of observers. They swim well and very high in the water and can dive without much effort but their flight is poor and laboured. They feed on water-snails, insects and the seeds, buds and shoots of water-plants and young crops. The males fight often during the breeding-season but without much energy or viciousness.

(2009) Hypotænidia striata obscuriora.

THE ANDAMAN BLUE-BREASTED BANDED RAIL.

Hypotænidia obscuriora Hume, Str. Feath., ii, p. 302 (1874) (Andamans).
Hypotænidia obscurior. Blanf. & Oates, iv, p. 162.

Vernacular names. None recorded.

Description. Similar to the preceding bird but darker and larger. The upper plumage is much blacker, the breast a deeper grey and the chin and throat much less white.

Colours of soft parts. Iris dark brown ; bill Indian red, tips of both mandibles and whole culmen deep horny-brown; legs and feet dark greenish-horny (*Davison*).

Measurements. Wing 129 to 136 mm.; culmen 33 to 36 mm.

The female is duller and rather greyer.

Distribution. The Andamans and Nicobars.

Nidification. The nidification differs in no way from that of the Indian bird and Osmaston took a wonderful series of their eggs from the first week in June to the end of August. The full clutch seems to be four to six eggs and these are on an average much more richly coloured than those of *H. s. gularis.* One hundred eggs average 36·0 × 27·5 mm.: maxima **39·2** × 28·7 and 37·0 × **29·4** mm.; minima **32·7** × 25·2 and 32·7 × **25·0** mm.

Habits. Similar to those of the preceding bird. It is extremely common in the Andamans and in some of the Nicobar islands, haunting swampy places both inside and on the fringe of forests.

Genus CREX.

Crex Bechstein, Ornith. Taschenb., ii, p. 336 (1803).

Type by mon., *Crex pratensis* = *Rallus crex* Linn.

The genus *Crex* differs from all other species of *Rallidæ* in its comparatively short stout bill, the depth of which at the base is equal to more than half the culmen; the tarsus is equal to the middle toe and claw; the wings are rather broad, the second primary longest and the first about equal to the fifth or sixth. The genus contains one species, a European bird extending to Northern Africa and Western Asia.

(2010) Crex crex.

THE CORN-CRAKE or LAND-RAIL.

Rallus crex Linn., Syst. Nat., 10th ed., i, p. 153 (1758) (Sweden).
Crex pratensis. Blanf. & Oates, iv, p. 163.

Vernacular names. None recorded.

Description. The feathers of the crown, hind-neck, back and scapulars to tail with blackish centres and ashy margins, the two colours linked by chestnut-brown; upper and under wing-coverts and axillaries chestnut; primaries, secondaries and primary coverts, chin, throat and breast ashy-grey, the chin and throat almost white and a darker brown line through the eye to the neck; flanks and sides of abdomen almost white and unbarred.

In summer the supercilium, sides of the head, neck and breast are browner and less grey.

Colours of soft parts. Iris hazel to red-brown; bill pale horny-brown, a little darker on the terminal portion of the culmen; legs and feet pale brown or fleshy-brown.

Measurements. Wing, ♂ 135 to 150 mm., ♀ 130 to 145 mm.; tail 40 to 50 mm.; tarsus 34 to 43 mm.; bill, ♂ 20 to 23 mm., ♀ 19 to 23 mm. (*Witherby*).

Young birds have the wing-coverts barred with white.

Nestlings. Black, the tips of the down on the upper parts dark buff.

Distribution. Practically the whole of Europe and West and Central Asia. In Winter it migrates to North Africa and a specimen was obtained by Scully at Gilgit.

Nidification. The Corn-Crake never breeds within our Indian area but is still comparatively common in many parts of Great Britain. The eggs number anything from six to fourteen, though clutches of eighteen have been recorded. The ground-colour varies from a yellowish- or greenish-stone colour to light reddish, whilst the spots consist of primary blotches of rather dark reddish-brown with others underlying them of neutral tint and grey.

Witherby gives the average of one hundred eggs as 37·26 × 26·75 mm.: maxima 41·6 × 25·8 and 38·3 × 29·0 mm.; minima 34·0 × 25·0 and 34·3 × 24·1 mm.

The breeding-season is principally during June but eggs are occasionally taken both in May and July. The nests of the Land-Rail are almost invariably placed in fields of grass and are often destroyed when these are cut for hay. Occasionally they will be found in nettle-beds or masses of weeds alongside hedges, but such sites are exceptional.

Habits. Those of the family, though this is essentially a land bird keeping to dry fields of grass and crops. It loud call of "crake, crake" is very ventriloquistic and is constantly uttered throughout the day. It feeds chiefly on insects and very largely on grasshoppers, but also on seeds and shoots of plants.

Genus PORZANA.

Porzana Vieill., Analy. Nouv. Orn., p. 61 (1816).

Type by mon., *Rallus porzana* Linn.

The genus *Porzana* differs from *Crex* in having the tarsus shorter than the middle toe and claw; the bill is short and fairly stout; the second primary is longest, or the second and third subequal, the first about equal to the sixth or seventh.

The birds of this genus are small and all our Indian species are curiously marked on the upper parts with small streaks of white, looking as if they had been carelessly spluttered on with a brush.

Porzana parva has been generically separated on account of its comparatively longer secondaries under the name of *Zapornia* but I agree with Blanford in uniting the two genera.

The genus is practically cosmopolitan, three species being found in India.

Key to Species.

A. Breast spotted with white; wing over 110 mm.	*P. porzana*, p. 11.
B. Breast immaculate; wing under 110 mm.	
a. Outer edge of primary brown; wing over 94 mm.	*P. parva*, p. 13.
b. Outer edge of primary white; wing under 93 mm.	*P. pusilla*, p. 14.

(2011) Porzana porzana.

The Spotted Crake.

Rallus porzana Linn., Syst. Nat., 12th ed., i, p. 262 (1766) (France).
Porzana maruetta. Blanf. & Oates, iv, p. 166.

Vernacular names. *Gurguri-khairi* (Beng.); *Venna-mudi-kodi* (Tam.).

Description. Centre of crown, nape, neck and whole upper plumage rufescent olive-brown, each feather from crown to tail with broad back central streaks; hind-neck and upper back spotted with white; the lower back, rump, upper tail-coverts, scapulars and innermost secondaries streaked narrowly with white; outer wing-coverts immaculate except along the edge; inner wing-coverts with arrow-shaped white streaks edged with black; inner secondaries the same but with golden-rufous margins to the inner webs; quills brown, the first primary edged with white; lores and round the eye blackish; a line behind the eye rufescent; supercilium, sides of the head and neck and whole breast grey, speckled with white and washed with brown across the breast; centre of chin and throat and the abdomen white; flanks brownish-grey barred with white; vent and under tail-coverts buff; edge of wing white; remaining under wing-coverts and axillaries barred brown and white.

Colours of soft parts. Iris reddish-brown to red; bill yellow, orange at the base and darker, more greenish at the tip and along the culmen; legs and feet bright olive-green.

Measurements. Length about 200 to 220 mm.; wing 112 to 119 mm.; tail 47 to 52 mm.; tarsus about 33 to 35 mm.; culmen 19 to 21 mm.

Young birds are more brown below and have the white on the chin and throat more extensive.

Nestling. Down all black.

Distribution. Europe and West Central Asia. In Winter it migrates into Northern Africa and into India and is then not uncommon in Northern India from Sind to Bengal. Both Coltart and I obtained it in Assam and it has been recorded as far East as Arrakan. To the South it has occurred in Belgaum, and Jerdon stated that it occurred almost all over India, though it is probably an exceptional visitor South of Bengal or to the South of Bombay in Western India.

Nidification. The Spotted Crake is only a migrant to India and does not breed within our limits. In Central Europe it breeds principally during May and early June, but in Finland eggs may be taken as late as the middle of July. The nest is the usual Rail-like affair of coarse grass and rushes lined with finer grass, placed in amongst vegetation around the edges of swamps, at other times in a dry patch in a marshy field or, less often, away from water in amongst long grass or standing crops. The eggs generally number eight to ten but frequently larger clutches are found, fifteen eggs having been recorded. The ground-colour varies from greyish to greenish-buff, profusely marked all over with small spots and blotches of reddish-brown or purplish-brown with underlying spots of neutral tint and lavender-grey. The eggs, though quite Ralline in character, can be separated at a glance from those of any of the other Rails either resident in India or migratory. The average of one hundred eggs is given by Witherby as 33·62 × 24·57 mm.: maxima 37·5 × 24·8 and 33·0 × 26·8 mm.; minima 29·1 × 23·0 and 32·0 × 22·2 mm.

Habits. Generally speaking there is little to record about the Spotted Crane which is different from that of its nearest allies. I arrives in Northern India in early October, the first few birds coming in some ten days earlier, and it leaves again in March or

April. Like all the family it is a confirmed skulker and one but seldom sees it except when out Snipe shooting with a good line of beaters. It runs well but, in spite of the long distances it has to migrate, it is neither a very fast nor a very powerful flier. Like all the Rails it swims well. Its food consists of insects, small mollusca and worms as well as all sorts of seeds and shoots of aquatic and land plants.

(2012) Porzana parva.

THE LITTLE CRAKE.

Rallus parvus Scop., Ann. I. Hist. Nat., p. 108 (1769) (Carniola).
Porzana parva. Blanf. & Oates, iv, p. 164.

Vernacular names. None recorded.

Description.—Male. Centre of crown and neck dark brown, slightly rufous; remainder of upper parts more olive-brown, darkest on the rump; upper back, scapulars and innermost secondaries with broad black streaks and a few narrow white ones, these latter also extending to the lower back, rump and upper tail-coverts; wing-coverts light brown; quills darker brown; supercilia, sides of head and neck, chin, throat and whole lower plumage rather dark ashy-grey, the extreme posterior abdomen, flanks and under tail-coverts banded brown and white; under wing-coverts and axillaries light slaty-brown.

Colours of soft parts. Iris red, brown in young birds; bill green, the base red in summer; legs and feet yellowish-green to dull pale slaty-green.

Measurements. Total length about 200 mm.; wing 95 to 106 mm.; tail 50 to 60 mm.; tarsus 30 to 31 mm.; culmen 18 to 20 mm.

Female. Supercilia and face paler grey; chin, throat and foreneck almost white, becoming isabelline-buff on the rest of the lower parts, the vent and surrounding parts with under tail-coverts barred white and brown.

Very young birds have the supercilia, face and whole lower plumage white, barred with blackish-brown. These bars gradually disappear and in a more advanced stage the young become replicas of the female with very pale, almost white underparts.

Nestling. All black.

Distribution. Throughout South and Central Europe and South-Western and Central Asia, migrating in Winter to Northern Africa and to India into Sind and Baluchistan; Scully also obtained it in Gilgit.

Nidification. The Little Crake breeds throughout South and Central Europe as well as in Western Asia, probably as far East as Persia and Turkestan. The breeding-season lasts from early May to the end of June, though a few birds continue to breed as late as the middle of July. The nest differs in no way from that of the other Rails and, like them, is placed in any thick vegetation around lakes, swamps or the banks of streams. The eggs number from six to twelve, generally seven or eight. The ground-colour is a pale ochre or buff-brown, sometimes with a rather greenish tint, whilst the markings consist of numerous blotches and spots of darker brown scattered fairly numerously over the whole surface. There are also a few underlying spots of neutral tint, which in some eggs are rather more numerous and make the general tone of the egg more dull and grey. The surface is smooth and generally glossless. The average of one hundred eggs is 30·45 × 21·73 mm.: maxima **30·5 × 23·0** mm.; minima **28·0 × 19·0** mm.

Habits. This little Rail is an inveterate skulker and may be rather less rare than it appears to be in India. In all respects its habits are typical of the family and it swims well and can dive also. Its diet is mainly insectivorous and these mostly aquatic as this Rail keeps much to lakes and swamps.

(2013) Porzana pusilla pusilla.

The Eastern Baillon's Crake.

Rallus pusillus Pall., Reis. Russ. Reich., iii, p. 700 (1776) (Dauria).
Porzana pusilla. Blanf. & Oates, iii, p. 165.

Vernacular names. *Jhilli* (Nepal).

Description. Upper plumage rufous-brown, the feathers streaked with black, the streaks on the hind-neck inconspicuous and the wing-coverts without any; scapulars, back, rump, upper tail-coverts and inner wing-coverts curiously streaked or marked with white as if smeared with white paint; quills brown, the first primary conspicuously edged with white; lores next the eye and a small streak behind it rufous-brown; supercilium, sides of head and neck, breast and anterior abdomen grey sometimes tinged ashy; posterior abdomen, vent and under tail-coverts barred brown and white.

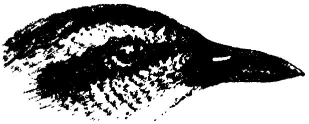

Fig. 3.—Head of *P. p. pusilla.* ¼.

Colours of soft parts. Iris red in adults, red-brown in younger birds and dull blue-brown in nestlings; bill horny-green to green, the culmen and tip darker; legs and feet yellowish-green to dull green, claws horny-brown.

Measurements. Total length about 200 mm. or less; wing 84 to 91 mm.; tail 40 to 46 mm.; tarsus 27 to 28 mm.; culmen 14 to 16 mm.

Young birds have the underparts almost white, the sides of the neck, breast and flanks suffused with pale ruddy-brown; the brown eye-streak is broader than in the adult.

Nestling. All black; a greenish tinge to the tips of the down.

Distribution. Ceylon, all India, Burma and the Andamans; as far West as Afghanistan and East to the Indo-Chinese countries and all China. It occurs through the Malayan Archipelago to the Philippines.

Nidification. The Eastern Baillon's Crake breeds in great numbers in the Kashmir lakes during the end of May, June and early July, a few birds laying as late as the end of August. The nest is made of rushes and grass or, occasionally, of rice leaves, and is placed in among any kind of dense cover, but preferably in short thick grass. Some nests are placed on the floating islands of weeds well out in the lakes, others in the reeds and rushes round them and others in the short grass at the edges of the lake or on the larger and drier islands. It is always well concealed, warm and dry and, as the bird always creeps quietly away before it can be seen, its nest is very hard to find. The eggs number six or seven, occasionally eight, whilst often four or five are incubated. They are like those of the preceding bird but, as a series, are darker, more richly marked eggs as well as being much smaller. One hundred eggs average 28·1 × 20·0 mm.: maxima **30·0** × 21·1 and 29·1 × **21·8** mm.; minima **26·0** × 20·0 and 26·1 × **19·1** mm.

Habits. Those of the genus. In Winter this little Rail wanders down from the Himalayas in great numbers into the North-West plains of India but many individuals remain throughout the year in Kashmir though others, on the other hand, remain in the plains and breed there in August and September, nests having been found in these months by Hume, Brooks, and Buller at Etawah and Deesa. Over the rest of India it is less common but its skulking habits cause it to be often overlooked whilst, when it does fly, it looks so like a small Quail that it is often mistaken for one. It is chiefly insectivorous in its diet but devours worms and grubs and also eats the seeds and berries of many kinds of plants.

Genus RALLINA.

Rallina Reichenbach, Synops. Avium, i (1845).

Type by orig. desig., *Rallus fasciatus* Raffles.

The birds of this genus differ from *Rallus* in having a shorter bill, which is much shorter than the middle toe which, again, is shorter than the tarsus; the wing is rounded, the third primary longest. In *Rallina canningi* the secondaries slightly exceed the primaries in length and in the other species are a little shorter.

The genus ranges from India and Ceylon to Australia and three species are found within our limits.

Key to Species.

A. Back and wings olive-brown; culmen 27 to 28 mm.	*R. superciliaris*, p. 16.
B. Back and wings rufous-brown; culmen 20 to 21 mm.	*R. fasciata*, p. 17.
C. Upper plumage deep ruddy-chestnut; culmen 29 to 33 mm.	*R. canningi*, p. 18.

(2014) Rallina superciliaris superciliaris.

THE BANDED CRAKE.

Rallus superciliaris Eyton, Ann. Mag. Nat. Hist., vi, p. 230 (1834) (Malay Peninsula).
Rallina superciliaris. Blanf. & Oates, iv, p. 167.

Vernacular names. *Daobui-lai* (Cachari).

Description. Chin and throat pure white, in younger birds more or less tinged with rufous; head, neck and breast chestnut; remaining upper parts and wing-coverts dark brown, slightly washed with olive; wing-quills dark brown; lower breast, abdomen and underparts barred black and white, the centre of the abdomen practically unmarked with black.

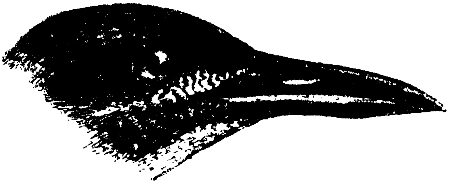

Fig. 4.—Head of *R. s. superciliaris.* $\frac{1}{1}$.

Colours of soft parts. Iris crimson-red or blood-red; bill green, the terminal half of the upper mandible and tip of lower dark brown; legs dull greenish-plumbeous, plumbeous or black.

Measurements. Total length about 250 mm.; wing 122 to 132 mm.; tail 55 to 64 mm.; tarsus 39 to 46 mm.; culmen 27 to 28 mm.

Young birds have the upper parts of the head and neck concolorous with the back; sides of the head and neck more ashy-brown: breast brown; inner webs of quills more or less barred with dull white, a few white and black bars on scapulars and wing-coverts.

Irides dull brown; legs greenish-plumbeous.

Distribution. Ceylon and the sub-Himalayas from the North-West Frontier to E. Assam. Thence in small numbers here and there throughout the well-wooded, wetter parts of India. It also occurs in South Burma, the Malay States and Annam.

In the Philippines its place is taken by *R. s. eurizonoides*, a race with deeper rufous colour and either no white or very little on the chin and throat.

Nidification. Betham, Bell and Harvey took numerous nests of this species during the Rains, June to September, at Khandalla and in Kanara. The nests were made of grass, roots, leaves etc. and were placed in bamboo-clumps, tangles of creepers, thick bushes etc. up to some six feet from the ground or, sometimes, on the ground. They were always built in dense scrub or deep forest and very hard to find. The eggs number four to seven and when newly laid are pure white but the texture is soft and porous with a thick exterior layer of calcium, very like the eggs of the Crow-Pheasants, so that they soon get stained and discoloured. Ninety eggs average 33·7 × 26·0 mm.: maxima **35·8** × 25·4 and 35·1 × **28·1** mm.; minima **30·9** × **25·0** mm.

Habits. Bell says that these little Rails are extremely shy and retiring and almost impossible to put up without dogs. When flushed they take to the nearest thickly-foliaged tree and seem quite at home there. They call mornings and evenings and when it is wet or misty during the day also. The cry is described as like that of a hen after laying an egg, whilst if suspicious of danger the bird utters a sound like "k-r-r-r-r" in a subdued tone. They feed on insects.

(2015) Rallina fasciata.

THE MALAYAN BANDED CRAKE.

Rallus fasciatus Raffles, Trans. Linn. Soc., xiii, p. 328 (1822) (Malay Peninsula).

Rallina fasciata. Blanf. & Oates, iv, p. 169.

Vernacular names. None recorded.

Description. Whole head, neck and breast deep chestnut, the chin and throat often a little paler and the crown darkest; remaining upper parts, scapulars and innermost secondaries rufous-brown; wing-coverts black with broad white bars; quills dark brown, barred on both webs with whitish; below broadly barred with black and white, the under tail-coverts more or less rufous on the longest feathers.

Colours of soft parts. Iris crimson or blood-red; bill blackish, the base paler and tinged with greenish or plumbeous-slate; gape and orbital skin crimson; legs and feet coral-red; claws slate or horny-blue.

Measurements. Length about 240 to 250 mm.; wing 118 to 131 mm.; tail 49 to 51 mm.; culmen 20 to 21 mm.

Young birds have the head and neck the same colour as the back; the breast is pale dull brown and the remaining underparts are whitish obscurely marked with brown bars.

Distribution. From Karennee and Rangoon South through the Malay Peninsula to the Celebes and Moluccas, Borneo, Java and Sumatra. I also obtained it on several occasions in North Cachar.

Nidification. This Rail breeds during August and September, making a crude nest of leaves and grass in dense forest, often far from water, among bushes and scrub. The eggs number four or five and are like those of the preceding bird. Twelve eggs average 31·1 × 23·6 mm.: maxima **35·0** × **25·4** mm.; minima **27·2** × **21·9** mm.

Habits. Those of the genus. Shy, retiring little birds about which very little is known. In Assam this Rail keeps to the densest forest but in Lower Burma and the Malay States it is sometimes found in scrub-jungle around villages. A hen bird caught in a servant's house in an exhausted condition, as soon as it recovered attacked the hand that held it, uttering hoarse grunts or growls. Whether these birds are migratory or not is not known but possibly they indulge in local seasonal changes either in search of special food or under climatic pressure. It is unlikely that they are migratory in the true sense of the term.

(2016) Rallina canningi.

THE ANDAMANESE BANDED CRAKE.

Euryzona canningi (Tytler), Blyth, Ibis, 1863, p. 119 (Port Canning, Andamans).
Rallina canningi. Blanf. & Oates, iv, p. 169.

Vernacular names. None recorded.

Description. Whole upper plumage, head, neck, breast and inner secondaries deep chestnut; wing-coverts the same but a few of the median and greater obsoletely barred with white and dark brown; primaries and outer secondaries dark brown edged with chestnut, barred on the inner webs with whitish and also, less distinctly, on the outer webs of the first two or three primaries; lower parts boldly barred with black and white.

Colours of soft parts. Iris red; bill pale green; legs and feet olive-green.

Measurements. Total length 325 to 350 mm.; wing 151 to 163 mm.; tail 73 to 92 mm.; tarsus 56 to 62 mm.; culmen 29 to 33 mm. As usual in Rails, the males exceed the females in *average* measurements, though there is much overlapping in size.

Distribution. The Andaman Islands.

Nidification. Osmaston obtained a fine series of the nests and eggs of this Rail in 1907, whilst Wickham and Anderson obtained others later. All these nests appear to have been made of dead leaves, grass and rushes and to have been placed on the ground in marshy land or on the borders of streams in dense forest. In one case only does the record show that the nest was placed on a thick bush above the ground at a height of some three feet.

The nests contained three to five eggs of the same texture and colour as those of the other *Rallinæ* but the chalky covering with its shiny yellowish-white surface is perhaps rather more pronounced. Thirty-two eggs average 40·6 × 30·8 mm.: maxima **43·1** × 30·8 and 41·3 × **32·0** mm.; minima **37·2** × 30·0 and 39·4 × **29·7** mm.

Habits. This is a bird of dense forests and thick secondary growth, especially where the ground is swampy or close to a stream. Its flight is said to be slow and heavy and its food to consist of insects, freshwater fish and shrimps.

Genus **AMAURORNIS.**

Amaurornis Reichenbach, Nat. Syst. Vög., p. 21 (1852).

Type by orig. desig., *Gallinula olivacea* Meyer.

The genus *Amaurornis* differs from *Porzana* and *Gallinula* in its more rounded wing, the third quill being longest, the second equal to the fifth or sixth and the first much shorter; the bill is short, about two-thirds the length of the tarsus, which is shorter than the middle toe with claw. In shape the bill varies somewhat. In *A. olivaceus* and *A. phœnicurus* the base is rather swollen but not so in the other species; on the other hand, although *A. phœnicurus* differs from the other species considerably in type and colour of plumage, *A. olivaceus* forms in this respect a link between them. If we place *A. akool* and *A. bicolor* with *A. fuscus* in the genus *Limnobænus*, it would seem only consistent to place *A. phœnicurus* in Reichenbach's genus *Erythra*. Under the circumstances I retain them all under the one genus *Amaurornis*.

Key to Species.

A. Breast grey or rufous; bill not swollen at base.	
a. Breast in adults vinous-chestnut, dark olive in the young	*A. fuscus*, p. 19.
b. Breast dark grey.	
a'. Back rufous-brown	*A. bicolor*, p. 26.
b'. Back dark olive	*A. akool*, p. 25.
B. Breast white; bill swollen at base	*A. phœnicurus*, p. 22

Amaurornis fuscus.

Key to Subspecies.

A. Smaller; wing 97 mm. or under.	
a. Darker, less olive more brown above	*A. f. fuscus*, p. 20.
b. Paler, faintly yellowish above	*A. f. zeylonicus*, p. 20.
B. Larger; wing 99 mm. or over.	
c. Much paler above and below; wing 105 to 122 mm.	*A. f. erythrothorax*, p. 22.
d. Darker; wing 97 to 110 mm.	*A. f. bakeri*, p. 21.

(2017) Amaurornis fuscus fuscus.

THE RUDDY CRAKE.

Rallus fuscus Linn., Syst. Nat., 12th ed., i, p. 262 (1766) (Philippines).
Amaurornis fuscus. Blanf. & Oates, iv, p. 170 (part.).

Vernacular names. None recorded.

Description. Forehead and crown to the sinciput, sides of the head and neck, lower plumage to the abdomen vinous-chestnut; upper plumage dark olive-brown, the rump, upper tail-coverts, tail and wing-quills darker brown; flanks and abdomen olive-brown; under tail-coverts blackish-brown edged with white; chin and centre of throat white, more or less tinged with chestnut.

Colours of soft parts. Iris crimson, brown in young birds and glaucous blue-brown in nestlings; bill horny-green to brownish-green, the tip of the lower mandible yellowish; eyelids plumbeous-grey with a red rim; legs and feet reddish-orange to brick-red.

Measurements. Total length about 215 mm.; wing 87 to 97 mm. (once 99 mm.); tarsus about 36 mm.; culmen 19 to 21 mm.

Young birds are darker above and have the crown concolorous with the back; supercilia, sides of head and neck and lower plumage dull white barred everywhere with dusky-brown; flanks and thighs dull olive-brown; under tail-coverts as in adult.

Nestling. Black with fulvous spots behind the ear-coverts.

Distribution. Philippines, Celebes, Java, Sumatra, Borneo etc. through the Malay States to Southern Siam and Tenasserim.

Nidification. Nothing recorded.

Habits. Similar to those of the better-known races.

(2018) Amaurornis fuscus zeylonicus.

THE CEYLON RUDDY CRAKE.

Amaurornis fuscus zeylonicus Stuart Baker, Bull. B.O.C., xlvii, p. 73 (1827) (Ceylon).
Amaurornis fuscus. Blanf. & Oates, iv, p. 170 (part.).

Vernacular names. *Punchi korowakā* (Cing.); *Kanan-koli* (Tam.).

Description. Very close to to the typical form but never so dark and with a faint olive-yellow tinge on the upper plumage.

Colours of soft parts as in the other races.

Measurements. Wing 87 to 96 mm.; culmen 19 to 20 mm.

Distribution. Ceylon and South-West India to Kanara and Belgaum.

Nidification. In Ceylon Phillips obtained eggs in September and August, in Travancore Stewart took nests with eggs in June, whilst in Kanara Davidson found them from the middle of May to the end of September. In every case the nest was just a little pad of grass or rice-straw hidden among the rank weeds and grass growing on the small boundary banks between rice-fields. The birds were very shy, sneaking off before they could be seen and refusing to fly even when the fields were beaten through. The eggs, from four to seven in number, have the ground-colour a pale cream, rarely a deeper buff or salmon-red, well covered with small blotches of rufous-brown or deep reddish-brown and secondary markings of pale neutral tint or lilac. Thirty-four eggs average 30·0 × 22·5 mm.: maxima **33·0** × 23·0 and 30·4 × **23·2** mm.; minima **27·8** × 22·3 and 28·4 × **21·5** mm.

Habits. The Southern form of this Crake is said to haunt rice-fields and swamps, whilst, in Ceylon, it may also be found in some of the huge forest tanks. In other respects it does not differ from the next bird.

(2019) Amaurornis fuscus bakeri.

THE NORTHERN RUDDY CRAKE.

Porzana fusca bakeri Hartert, Nov. Zool., 1917, p. 272 (Kumaon).
Amaurornis fuscus. Blanf. & Oates, iv, p. 170 (part.).

Vernacular names. *Di-daobui-gajao* (Cachari).

Description. Slightly paler than the preceding race and decidedly larger.

Colours of soft parts as in the other races.

Measurements. Wing 99 to 110 mm., very rarely under 100 mm.; culmen 21 to 24 mm.

Distribution. Northern India from the Afghan frontier (*Whitehead*) and Kashmir to Assam, Bengal, Chin Hills and Arakan. Kachin Hills birds (*Harington*) are intermediate, whilst Yunnan and Shan States birds are nearest the Chinese form.

Nidification. This little Crake breeds in great numbers in Kashmir and again in Eastern Bengal and Assam and in smaller numbers in suitable country between these points. The nest is a pad of rushes, grass or rice-blades well hidden in grass, reeds or rice and may be placed either round about, or in the interior of, swamps, in rice-fields or on adjoining banks, or, less often, in marshy meadows at some little distance from the water. They are built actually on the ground but occasionally one may be seen on a tangled mass of vegetation or thick bush a few inches above it. The eggs number five to eight and only vary from those of the Ceylon form, already described, in being rather larger. One hundred average 32·3 × 22·7 mm.: maxima **34·2** × 23·3 and 32·1 × **24·1** mm.; minima **29·0** × 23·1 and 30·1 × **21·8** mm. In Assam they breed from June to September and in Kashmir from July onwards.

Habits. In Eastern Bengal this Crake literally swarms during the cold weather, when its numbers are probably increased by local migrants from the immediate North; otherwise it seems to be a resident bird over all its habitat. In the mornings and evenings it haunts rice-fields, swampy meadows and semi-open country but in the heat of the day it retires to the vegetation of deeper water or to reed-beds. It is a most accomplished skulker, avoiding showing itself even when its cover is systematically beaten. It flies well and fast, looking like a tiny Quail, except for its hanging legs as it rises. For two hundred yards or so it flies direct just above the water or cover and then hurls itself headlong into the latter. It feeds on freshwater mollusca, insects and the seeds and shoots of water-plants and young rice. Its call is a soft crake, which Hume syllabifies as "keek-keek-keek," but it is a silent bird, even in the breeding-season.

(2020) Amaurornis fuscus erythrothorax.

THE CHINESE RUDDY CRAKE.

Gallinula erythrothorax Temm. & Schlegel, Fauna Jap., Aves, p. 121, pl. 28 (1849) (Japan).
Amaurornis fuscus. Blanf. & Oates, iv, p. 170 (part.).

Vernacular names. None recorded.

Description. Paler than any of the other races; the lower parts are a paler rufous and the crown less rufous anteriorly. It is also the biggest of all the races.

Colours of soft parts as in the other races.

Measurements. Wing 105 to 122 mm.; culmen 21 to 24 mm.

Distribution. Japan, China, the Indo-Chinese countries to the Shan States.

Nidification. Herbert took eggs of this race near Samkok in Siam in July. They do not differ from those of the other races but are rather unusually broad in proportion to their size, measuring 28·8 × 23·4 mm.; they are probably abnormally small.

Habits. Those of the species.

Amaurornis phœnicurus.

Key to Subspecies.

A. Smaller; wing 142 to 160 mm. . . . . *A. p. phœnicurus*, p. 23.
B. Larger; wing 157 to 173 mm.
  a. Darker and blacker generally but with more white on the forehead . . . . *A. p. insularis*, p. 25.
  b. Paler and with less white on the forehead . . . . *A. p. chinensis*, p. 24.

(2021) Amaurornis phœnicurus phœnicurus.

THE WHITE-BREASTED WATER-HEN.

Rallus phœnicurus Pennant, Ind. Zool., ix, p. 10 (1769) (Ceylon).
Amaurornis phœnicurus. Blanf. & Oates, iv, p. 173 (part.).

Vernacular names. *Bole-Radi* (Tel.); *Tannin Koli*, *Kannung Koli* (Tam., Ceylon).

Description. Forehead, supercilia, sides of the head, chin to vent pure white; upper parts, wings and sides of the body from breast to vent dark slaty-grey more or less washed with olive, the upper tail-coverts generally browner; tail and wing-quills blackish, the first primary with white outer web; posterior flanks, thigh-coverts, vent and under tail-coverts dingy rufous; axillaries and under wing-coverts slaty edged with white.

Colours of soft parts. Iris brown in the young to crimson in the breeding male: bill green, the base of the upper mandible red, the tip and lower mandible paler and more yellow; legs and feet dull chrome-yellow to yellowish-green.

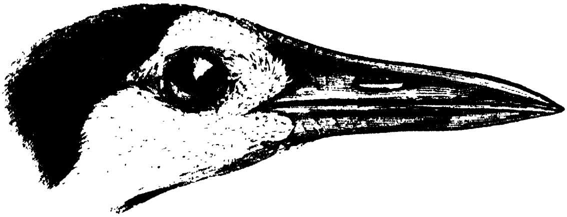

Fig. 5.—Head of *A. p. phœnicurus.* $\frac{1}{1}$.

Measurements. Total length about 320 mm.; wing 142 to 160 mm.; tail 58 to 66 mm.; tarsus 49 to 57 mm.; culmen 35 to 42 mm.

Young birds have the feathers of the forehead and face tipped with slaty, obscuring the white; the upper parts are more olive-brown than slaty-grey.

Distribution. Ceylon and Southern Travancore only.

Nidification. Wait and Phillips have taken the eggs of this Rail in every month of the year in Ceylon. The nest is a roughly put together structure of twigs with a thick lining of grass or paddy-straw or may be made of grass only. It is placed either in a thick bush a little above the ground or on the ground in among vegetables round tanks and swamps. The eggs number three to five and in ground-colour vary from a very faint yellowish-cream to yellowish stone-colour or pale buff. The markings consist of longitudinal blotches and spots scattered sparsely over the whole surface of the egg and rather more numerous at the larger end. The primary blotches are light to dark reddish-brown and the secondary lavender to purplish-grey. Forty eggs average 39·5 × 30·0 mm.: maxima **42·1** × 30·3 and 40·5 × **31·5** mm.; minima **37·0** × **28·0** mm.

Habits. In the mornings and evenings this Rail feeds much in the open, walking about quietly on the tops of the water-weeds or in the fields, whilst in the heat of the day it keeps to the denser reeds or to the forest and jungle round the lakes and swamps. It is less of a skulker than most birds of the family, easier to induce to fly, less intolerant of observation and, often, quite tame and familiar. This is especially the case when it haunts small ponds in the vicinity of villages. It feeds on young rice and water-plants, seeds, grain, insects, worms, mollusca etc. During the breeding-season it is a very noisy bird and its harsh roars are audible at a great distance. At the same time it has many other notes, some chuckling, some quite soft and low. They are pugnacious birds but do not carry their quarrels to an extreme.

(2022) Amaurornis phœnicurus chinensis.

THE CHINESE WHITE-BREASTED WATER-HEN.

Fulica chinensis Boddaert, Tabl. Pl. Enl., p. 54 (1873) (China).
Amaurornis phœnicurus. Blanf. & Oates, iv, p. 173 (part.).

Vernacular names. *Dawak*, *Dahak*, *Dauk* (Hin.); *Kinati* (Oudh); *Kuraki* (Sind); *Kureyn* (Gond.); *Kalu-gwet* (Burma); *Pani-duboi* (Assam).

Description. A rather paler form than the preceding; the breast not so pure a grey with more olive tinge. It is also a decidedly larger bird.

Colours of soft parts as in the other races.

Measurements. Wing 158 to 173 mm. (Stresemann gives the measurements of a huge series as 144 to 187 mm. but any under 150 are exceptional); culmen 36 to 41 mm.

Distribution. Found resident almost throughout India, Burma and China and South to Malacca, Hainan and Formosa.

Nidification. Similar to that of the typical form but the nests are often built in thick bushes many feet above the ground and a wider selection of materials is used in their construction. Twigs, creepers, tendrils, leaves etc. are often used and the nests are sometimes quite bulky platforms. The eggs are typical of the species but number up to seven or eight, whilst one hundred eggs average 40·5 × 29·7 mm.: maxima **45·0** × 31·0 and 41·1 × **31·9** mm.; minima **37·0** × 29·5 and 37·2 × **28·0** mm.

The breeding-season is principally July to September, but I have taken eggs in May in Assam, whilst Jones took them in the same month in China. Occasionally they breed in small colonies.

Habits. Those of the species. I have watched these birds in the reeds, among which they climb quite easily, though not with the strength and speed of the Purple Moorhen.

(2023) Amaurornis phœnicurus insularis.

THE ANDAMAN WHITE-BREASTED WATER-HEN.

Amaurornis insularis Sharpe, Cat. B. M., xxiii, p. 162 (1894) (Andamans).
Amaurornis phœnicurus. Blanf. & Oates, iv, p. 173 (part.).

Vernacular names. None recorded.

Description. This is the darkest of all the Indian forms and has the white on the forehead more extensive. The breast is a blackish-grey with very little olive tint.

Measurements. Wing 157 to 173 mm; culmen 37 to 44 mm.

Distribution. Andamans only.

Nidification. Osmaston obtained a fine series of eggs of this form during June and July; most of the nests were in grass and rushes in swamps but others were on low thick bushes two or three feet from the ground. Fifty eggs average 40·8×31·0 mm.: maxima **43·0**×32·0 and 40·8×**32·2** mm.; minima **37·2**×31·0 and 39·5×**29·0** mm. They number three to five, in one instance six.

Habits. Those of the species.

(2024) Amaurornis akool akool.

THE BROWN CRAKE.

Rallus akool Sykes, P. Z. S., 1832, p. 164 (Deccan).

Vernacular names. None recorded.

Description. Whole upper parts, wings and tail dark olive-brown, the quills rather darker brown and less olive; lores, indistinct supercilia, sides of head and neck and lower plumage ashy-grey, passing into brown on the posterior abdomen, vent and under tail-coverts; chin and centre of throat whitish, passing into the grey of the surrounding parts.

Colours of soft parts. Iris brown in young birds to blood-red in breeding males; bill greenish-horny to pale green, more blue at the tip; legs and feet fleshy-brown to livid purple.

Measurements. Wing 114 to 131 mm.; tail 54 to 63 mm.; tarsus 46 to 51 mm.; culmen 28 to 32 mm. Females average smaller than males.

Chicks in down. Black.

Distribution. Northern India from Kashmir to Gowhati in West Assam, South to Bengal, Behar, Central Provinces, the South Deccan, Mysore and Rajputana. I cannot trace any specimen from North Khasia Hills, nor did I ever see it there myself. There is on the other hand a specimen in the British Museum from Gowhati in the Kamroop District.

Nidification. The Brown Crake breeds from May to September, making a pad nest of reeds, grass or rushes and water-weeds either in among the reeds quite close above the water or a more substantial nest of the same materials mixed with twigs, leaves and creepers which it places in a thick bush or tangle of canes in or close to the water. The nest is nearly always well concealed and, as it is small for the size of the bird, is not easy to find. The number of eggs laid varies from four to six and in appearance are very like rather richly-coloured eggs of the Common Water-Rail. The ground-colour is anything from a pale yellow- or pinkish-stone to a warm salmon or buff. The markings consist of fairly bold, well-defined spots and blotches of pale reddish-brown to deep reddish-purple, scanty everywhere but rather less so at the larger end.

Habits. Like all the Rails this is a very shy bird, keeping to dense cover in swamps and on the borders of streams. Its flight is said to be heavy and slow but its speed on foot and its agility in climbing reeds and bushes remarkable. It feeds largely on land-snails, slugs, worms etc. and for this purpose comes into the open in the very early mornings and late evenings.

(2025) **Amaurornis bicolor.**

ELWES'S CRAKE.

Porzana bicolor Walden, Ann. Mag. Nat. Hist. (4) iv, p. 47 (1872) (Sikkim).

Vernacular names. None recorded.

Description. Head, neck and lower plumage dark ashy-grey, darkest on the crown and nape and paler on the sides of the head, changing to albescent on the chin; upper parts, wing-coverts, and inner secondaries rich brownish-rufous; tail black; wing-quills dark brown.

Colours of soft parts. Iris brown in the young to blood-red in breeding males; bill pale glaucose-green tipped paler and greyer and with a red patch near the base, more vivid in the breeding-season; legs and feet dull red to rather bright brick-red.

Measurements. Wing 112 to 119 mm.; tail 57 to 60 mm.; tarsus 37 to 39 mm.; culmen 21 to 27 mm.

Distribution. Nepal and Sikkim to Eastern Assam; Khasia and Cachar Hills, Manipur and Northern Burma to Yunnan and the Shan States.

Nidification. This Crake breeds in considerable numbers in the Khasia Hills, as also in the North Cachar Hills in the few places suitable to it. In Sikkim it is said to breed between 4,000 and 6,000 feet, but in Assam we took nests anywhere above 3,000 feet, whilst in Dibrugarh it was not uncommon practically down to the foot-hills. Most of the nests personally found by me were in quite small patches of jungle round about, or between, rice-fields at an elevation of some 5,500 feet. Here they were very numerous and I found nearly a dozen birds breeding in a small patch about 100 yards long by 60 wide. The nest differed in no way from that of the Brown Crake and was usually built a few inches above the water, though one was built up in a rhododendron-tree in deep forest and some way from water.

The eggs only differ from those of the Brown Crake in being more richly coloured. Eighty eggs average 33·9 × 26·1 mm.: maxima **36·3** × 25·3 and 35·3 × **27·0** mm.; minima **31·3** × 26·1 and 32·3 × **25·1** mm.

The breeding-season is from the middle of May to the end of August, whilst the number of eggs laid varies from five to seven.

Habits. The habits of Elwes's Crake are much the same as those of the Brown Crake. In the hills south of the Brahmapootra we found it kept to patches of jungle, scrub and rushes between or round the rice cultivation or, where there was none of this, to small ponds and pools in or near forest. They also frequented small streams, especially those which had plenty of cover on one side and open grass-land on the opposite one. They often came out of the cover in the early mornings and late evenings and fed on the grass-land, picking up small grasshoppers, land-shells and small worms. On the least sign of danger they scuttled down to the bank and either swam or flew to the cover on the far side. When frightened they ran with head and tail depressed and covered the ground at a great pace but, at other times, their walk was the usual slow jerky movement affected by all Rails. I have never heard their call, even in the breeding-season, though I attributed to this bird a deep grunting noise, very loud and resonant, which I sometimes heard, late in the evening, in their favourite haunts.

Genus GALLINULA.

Gallinula Brisson, Ornith., i, p. 54; vi, p. 2 (1760).

Type by taut., *Fulica chloropus* Linn.

In this genus the toes, which are furnished with a narrow straight-edged membrane or web, are very long, the middle toe without claw being about equal to the tarsus; the bill is moderate, the basal portion of the culmen bent up in the forehead to form a shield with a rounded posterior edge; the nostrils are long and narrow; the second primary is longest, or second and third subequal; the first is about equal to the fifth or sixth. This genus is found over the greater part of Africa, Europe and Asia to Australia and New Zealand.

Gallinula chloropus.

Fulica chloropus Linn., Syst. Nat., 10th ed., i, p. 152 (1758).

Type-locality: England.

The European bird is rather larger than the Eastern form with a relatively larger bill.

(2026) Gallinula chloropus indicus.

The Indian Moorhen.

Gallinula chloropus? var. *indicus* Blyth, J. A. S. B., xi, p. 887 (1842) (Calcutta).
Gallinula chloropus Blanf. & Oates, Avifauna B. I., iv, p. 175.

Vernacular names. *Jal-Murghi, Pani-Murghi* (Hin.); *Dakab-paira* (Beng.); *Jumbu-kodi, Boli-kodi* (Tel.).

Description. Head and neck black, passing into dark slaty-grey on the breast, flanks and extreme upper back; remaining upper parts rich deep mahogany-brown, the scapulars and feathers next the grey tinged with olive; tail almost black towards the tip; primary coverts, primaries and outer secondaries blackish, the first primary and border of wing edged white; below, the deep slaty of the upper breast pales posteriorly and the centre of the abdomen is mottled with white; under tail-coverts white except the central ones which are black; under wing-coverts grey tipped with white.

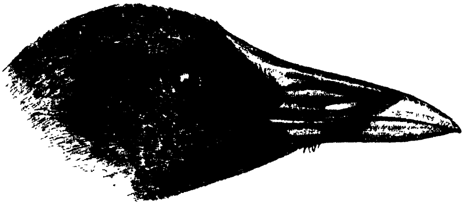

Fig. 6.—Head of *G. c. indicus.* ½.

Colours of soft parts. Iris red; frontal shield and base of bill bright red, the terminal third greenish-yellow; "tibia and front of tarsus greenish-yellow, hinder part of tarsus and all toes slaty-green; an orange ring round the tibia just below the feathered portion" (*Oates*).

Measurements. Wing 152 to 172 mm.; tail 52 to 68 mm.; tarsus 47 to 50 mm.; culmen, ♂ 38 to 41 mm., ♀ 32 to 35 mm.; the female is very little smaller than the male.

Young birds have the upper parts all brown, less rich and mahogany coloured than in the adult; the lower parts are rather more brown and less grey, much mixed with white.

Chick in down deep black throughout.

Distribution. Throughout India, Burma and Ceylon; South to the Malay States and East through the Indo- Chinese countries to China and Japan.

Nidification. The Indian Moorhen breeds throughout the plains wherever there are lakes and swamps, in the hills of Southern India to all heights where there is any water, in Kashmir up to

8,000 ft., whilst in Tibet it is said to be very common throughout the year in the marshes round Lhasa, over 12,000 ft. Its nest, like that of the European bird, may be built either in reeds and rushes or upon a bed of weeds and I have seen nests also in rice-fields. The eggs number five or six to fourteen and are indistinguishable from those of the typical form. The ground-colour is a pale yellowish stone-colour, rarely almost white or equally rarely warm buff, the markings consisting of small blotches of pale dull reddish sparsely scattered about the larger end. Two hundred eggs average 40·0 × 29·6 mm.: maxima **45·0** × 30·0 and 40·0 × **31·1** mm.; minima **36·1** × 30·4 and 39·3 × **27·0** mm.

Incubation takes 21 days and once it starts, the hen sits close but slips quietly away when disturbed and, by diving, puts some distance between herself and the nest before showing herself.

Habits. This Moorhen is extremely common in the better-watered parts of India and may be found on small ponds, large lakes and swamps which are well covered with reeds and water-plants but it seldom frequents rivers or streams. It runs well and speedily both on the ground and over water-weeds but its usual progress is a rather dignified walk with slow and jerky steps. Swimming, it rests high on the water with tail erect exposing the white under tail-coverts, whilst it can dive with speed and stay under water for nearly a minute at a time. The breeding-note is a loud, sharp "tieruch, tieruch," in addition to which they have many chuckling notes. The food of this bird consists of water-weeds and berries, grass, insects, snails, worms, frogs and even small fish.

Genus GALLICREX.

Gallicrex Blyth, Cat. B. Mus. A. Soc., p. 283 (1852).

Type by mon., *Gallicrex cristata* Lath. = *Fulica cinerea* Gmelin.

This genus consists of a single species spread over a very wide area from India to Japan.

The frontal shield is pointed behind, much larger in males than females and in the breeding-season ends in a fleshy hornlike protuberance; the bill is stout, moderately long, about equal to the hind-toe without the claw; all the toes long, the middle toe, without the claw, being longer than the tarsus; the wing is normally rounded, the second and fourth quills being equal and the third slightly the longest, whilst the first is between the sixth and eighth in length; the sexes are dissimilar and the male is much larger than the female.

(2027) Gallicrex cinerea.

THE KORA OR WATER-COCK.

Fulica cinerea Gmel., Syst. Nat., i, p. 702 (1789) (China).
Gallicrex cinerea Blanf. & Oates, Avifauna, B. I., iv, p. 176.

Vernacular names. *Kora*, *Kongra* (Hin.); *Kettala* (Cing., N.

Ceylon); *Willi-kukulu* (S. Ceylon); *Tannir-koli* (Tam., Ceylon); *Boun-dote* (Burma); *Khora-sorai* (Assam).

Description.—Adult male in breeding plumage. Head, neck and lower plumage black, the feathers edged with pale grey except on the posterior flanks and abdomen, where the edges are whiter and broader; hind-neck, back, scapulars and wing-coverts blackish-brown, broadly edged with light slaty-grey; rump and upper tail-coverts brown edged with fulvous-brown; outer wing-coverts dark brown edged with fulvous; quills blackish-brown, the outer web of the first primary white; under tail-coverts buff or buffy-white with brown bars and centres.

Colours of soft parts. Iris bright red; bill and shield at the base blood-red, paling and becoming more dusky yellow at the tip; the horn projecting from the back of the casque is bright red; legs and feet dull to bright red.

Measurements. Wing 211 to 227 mm.; tail 77 to 83 mm.; tarsus 75 to 77; culmen 37 to 38 mm.

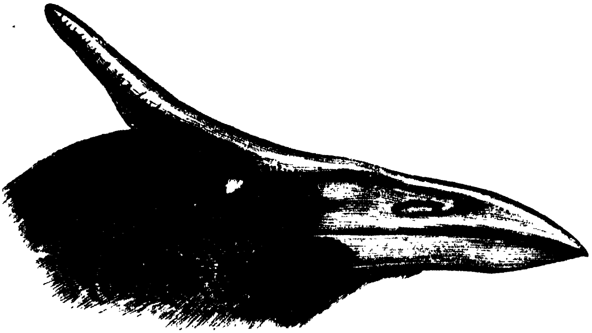

Fig. 7.—Head of *G. cinerea.* ½.

Female. Lores and feathers round the eye mixed dark brown and fulvous-white; crown brown faintly edged paler; upper parts, scapulars, tail and wing-coverts dark brown broadly edged with fulvous; quills dark brown, the outer web of the first primary white; lower parts pale buffy-brown, nearly white on the chin, throat and centre of the abdomen, barred everywhere with wavy lines of dark brown but the bars less obvious on the whitest parts; under tail-coverts buff, barred with blackish-brown.

Male in non-breeding plumage. Similar to the female.

Colours of soft parts. Iris yellow to yellowish-brown; bill horny-yellow with no casque, but the small triangle running into the forehead yellowish; legs and feet dull greenish-brown.

Measurements. Wing 172 to 184 mm.; tail 65 to 75 mm.; tarsus 65 to 68 mm.; culmen 32 to 34 mm.

Young birds are like the female but less barred below.

Chick in down. Black above, more brownish below.

Distribution. The whole of India, Ceylon and Burma, wherever the country is suitable and wet enough, but especially common in Bengal, Assam, the Malabar coast and the wettest areas in Southern Burma. Outside our limits it extends practically throughout the Indo-Chinese countries, the Malay Peninsula and Islands and again east through China to Japan.

Nidification. Over nearly all its habitat the breeding-season of the Water-Cock extends from the end of June to the beginning of September, most eggs being laid in the end of July and early August. In Ceylon it breeds in January and February and again in July and August. The nest is built low down in dense reeds at the water's edge or resting on the leaves of water-plants, further inside the swamps and, less often, in rice-fields. When built in reeds the nest is a bulky structure of weeds and rushes but at other times is very flimsy and badly put together. The eggs number three to five, rarely as many as eight. In appearance they are like handsome, richly-marked eggs of Moorhens. The ground-colour varies from pale pink or yellow stone-colour to deep brick-pink, profusely covered all over with blotches of light to dark reddish-brown, with secondary markings of neutral tint and lavender. One hundred eggs average 42·2 × 31·0 mm.: maxima **46·6** × 33·0 and 42·3 × **33·1** mm.; minima **38·9** × 31·3 and 39·5 × **28·1** mm.

During the breeding-season the Water-Cock is very pugnacious and the males fight desperately but, though the Sylhet natives assert that such is the case, they are probably not polygamous.

Habits. As the Water-Cock is much appreciated by the Indians for food, they are regularly hunted and are, in consequence, very shy and retiring in most of their haunts. When, however, these are more remote from mankind they are quite tame and do not shun observation, though, like most Rails, they are rather crepuscular and feed principally in the mornings and evenings. Their diet consists of freshwater mollusca, insects, grasshoppers and the seeds and shoots of water-plants as well as young green crops. The call, or challenge, is a deep boom uttered in rapid repetition and the birds also have many chuckling notes. They are much prized as fighters by the Sylhetis, who take their eggs, which they hatch by tying them up against their own waists in a cloth.

Genus **PORPHYRIO.**

Porphyrio Brisson, Ornith., i, p. 48, v, p. 522 (1760).

Type by taut., *Fulica porphyrio* Linn.

The genus *Porphyrio* contains several species of large Moorhens distinguished by their blue coloration and by a broad frontal shield covering the whole anterior crown and truncated posteriorly. The bill is deep, short and compressed and the small rounded nostril is not placed in a groove; the wing is rounded, the second, third and fourth longest and subequal and the first about equal to the sixth or seventh; the tarsus and toes are very long and powerful; sexes alike.

The genus is represented in Africa, Madagascar, the Mediterranean region, Southern Asia, the Malay Archipelago to Australia, New Zealand and the Pacific Islands.

Only one species occurs within our limits.

(2028) Porphyrio poliocephalus poliocephalus.

The Indian Purple Moorhen.

Gallinula poliocephala Lath., Ind. Orn. Suppl., p. 68 (1801) (India).
Porphyrio poliocephalus. Blanf. & Oates, Avifauna B. I., iv, p. 178.

Vernacular names. *Kaim, Kalim, Kharim, Khima* (Hin.); *Nila boli-kodi* (Tel.); *Kittala* (Cing.); *Indura kukula* (Cing., South Province); *Sannary* (Tam., Ceylon); *Kaim-Sorai* (Assam); *Dao-di Gatang-lili* (Cachari); *Lili Jal al-kauri* (Sylhet).

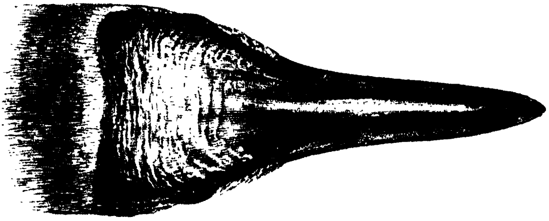

Fig. 8.—Head of *P. p. poliocephalus* (from above). 1/1.

Description. Lores and upper part of the head pale dingy grey-brown changing into deep purple-blue on the rest of the upper plumage; tail black with green reflections; exposed portions of the wings and scapulars greenish-blue; the outer primaries more blue, the innermost secondaries centred darker bronze-green, which shows up more as the blue-green edges become abraded; sides of the head grey tinged with cobalt-blue; chin, throat and fore-neck dull, pale cobalt-blue grading into darker greenish-blue on the breast; abdomen and flanks purple, showing obsolete pale edges, often absent; vent blackish-brown; under tail-coverts white.

Measurements. Wing 244 to 271 mm.; tail 82 to 108 mm.; tarsus 88 to 90 mm.; culmen 41 to 49 mm. Unlike most of our water-birds the female of this species is quite as big as the male and the largest measurements given above refer in each instance to a female.

Colours of soft parts. Iris deep blood-red, more brown-red in females and young birds; bill and casque blood red-brown, generally paler at the tip and more brown in the centre of the casque and the centre of the lower mandible; legs and feet pale dingy-red to dull red, browner at the joints; claws dull red, darker at the tips.

Female like the male but with a smaller casque.

Young in down black with white shafts to the down of the head and wings. Bill green at the tip, blackish at the base.

Distribution. Throughout the plains of India, Burma and Ceylon, wherever there are swamps, lakes and sufficient water. In Mesopotamia and Baluchistan our Indian bird is replaced by a very closely-allied race *P. p. seistanicus*; this form may possibly be found later on within the limits of this work. In the Malay Peninsula *P. p. edwardsi* takes the place of our bird. In this race the wings and upper plumage are dark bronze green-brown and possibly its status should be that of a species rather than that of a subspecies.

Nidification. The Purple Moorhen breeds throughout its range during the rainy season, *i.e.*, in Ceylon principally from February to April and in Northern India from the end of June to September. The nest is a rather massive affair of rushes, reeds and water-weeds, placed either in among dense reeds or on floating lilies and weeds and, where the bird is very common, half a dozen nests may be found quite close together. The eggs vary from three to seven, four or five forming the normal clutch. In colour they are like richly-coloured well-marked eggs of the Moorhen, the ground-colour varying from pale pinkish or yellowish-buff to a warm buff or reddish-buff. The markings consist of small blotches and spots of reddish-brown, scattered sparsely over the whole surface. One hundred eggs average 50·5 × 35·7 mm.: maxima **54·6** × 36·9 and 52·1 × **37·2** mm.; minima **45·7** × 36·1 and 49·3 × **34·2** mm.

Habits. The Purple Moorhen keeps almost exclusively to weedy lakes and swamps, where it wanders about feeding on aquatic vegetation and on insects and small mollusca. It is fond of clambering about on the reeds, climbing them hand over hand like a clumsy Reed-Warbler. They are noisy birds, uttering loud cacklings, grunts and hoarse rippling notes and, where they have not been harassed, are very tame and tolerant of observation. The Indians esteem its flesh very highly and it is consequently much persecuted in most places.

Genus FULICA.

Fulica Linn., Syst. Nat., 10th ed., i, p. 152 (1758).

Type by taut., *Fulica atra* Linn.

This genus is distinguished from all other Indian *Rallidæ* by every species having the toes fringed with a broad membrane divided into convex lobes, one to each phalange; the tarsus is short, less than the middle toe without claw and has a membranous fringe behind; the bill is moderate in length, rather deep and compressed, the culmen produced back over the forehead in a shield of varying shape; the plumage is always grey or blackish and the sexes are alike.

(2029) Fulica atra atra.

THE COOT.

Fulica atra Linn., Syst. Nat., 10th ed., i, p. 152 (1758) (Sweden); Blanf. & Oates, Avifauna B. I., iv, p. 180.

Vernacular names. *Dasari*, *Dasarni*, *Ari*, *Khurkul*, *Thekari*, (Hin.); *Barra Godar* (Purnea); *Boli-kodi* (Tel.).

Description. Head and neck black, shading into slaty-black on the upper plumage, the whole having a steel-blue sheen; below, the black of the throat shades into the slaty-grey of the underparts, palest on the centre of the breast and abdomen, darkest on the vent and under tail-coverts; primaries and outer secondaries grey, the first primary white on the outer web and the edge of the wing also white; outermost secondaries paler grey and mottled with white at the tips, this disappearing in very old birds.

Colours of soft parts. Iris red, red-brown or blood-red; bill and shield white, the former tinged with fleshy-pink, especially at the base; legs and feet dull greenish, tibia orange.

Measurements. Wing 185 to 220 mm.; tail 54 to 63 mm.; tarsus 56 to 64 mm.; culmen 33 to 38 mm. The measurements of the male and female differ very little. Witherby gives the measurements of twelve British birds as "Wing 200 to 225; bill from shield 33 to 38 mm."

Young birds are brown above and have the lower plumage paler and much more mottled with white.

Nestlings in down. Black, rather a greyish-black beneath; the down with hair-like tips, white over the body, yellowish on the wings, orange on the neck and throat and crimson-scarlet on the fore-crown and round the eyes.

Nestlings in later stage drop all the hair-like tips except the crimson ones.

Distribution. Practically the whole of Europe and Asia. In India it is found and is resident in every part of the country where there are large lakes and swamps, but in those parts in which the water dries up after the rains cease they are only visitors. It has not yet been obtained in Ceylon.

Nidification. The Coot breeds in India during the rainy season, making a compact well-built nest of rushes low down among reeds just like that of the English bird. This is often massive and conspicuous, having an ample depression for the eggs to rest in. The eggs number five to ten, seven or eight being found most often. The ground-colour is a pale yellowish or brownish-grey, less often a rather deeper buff or café-au-lait; over this are scattered tiny spots and freckles of blackish-brown with rather larger underlying marks of neutral tint. One hundred Indian eggs average 53·1 × 35·6 mm.: maxima **57·0** × 37·1 and 50·3 × **37·8** mm.; minima **47·5** × 35·0 and 50·3 × **34·3** mm. In India the eggs take about 21 days to hatch and the birds probably pair for life.

Habits. The Coot frequents large open stretches of water surrounded by ample cover and are not often found on smaller lakes and ponds. They spend nearly all the daytime swimming in the open water but in the mornings and evenings often resort to the fields to feed, both on the young crops and on insects, snails, worms etc. They are also known to steal other birds' eggs and have been accused of eating their chicks. For Rails they fly well once they are on the wing but are slow to start, and skitter along the top of the water for some yards before rising. The call is a loud, harsh "kraw-kraw" but they have many other conversational notes and the chicks have a shrill pipe to which the parents answer with a low chuckle. Coots are very gregarious and do not fight among themselves but are great bullies to other birds.

Family HELIORNITHIDÆ.

This small but remarkable family is undoubtedly very closely related to the *Rallidiæ*, from which, however, it differs in many important respects.

In the Finfoot the toes are furnished with a lobed fringe very similar to that of the Coots; the sternum is more massive, broader posteriorly, with a shallow notch on each side; there is no aftershaft; the wing is quincubital in our Indian species; there are no bare tracts on the neck; rectrices eighteen.

The flexor tendons are peculiar and appear to be a modification of the Galline arrangement. The *flexor longus hallucis* gives off a slip to supply the hallux and is then divided into three, each branch uniting with a similar branch from the *flexor perforans digitorum* to supply one of the other three toes.

The family contains three genera, of which one only is found in India.

Genus HELIOPAIS.

Heliopais Sharpe, Bull. B. O. C., vii, p. 37 (1893).

Type by mon., *Heliopais personata* Gray.

Bill from gape longer than tarsus and rather stout; culmen considerably curved; no frontal shield but in the breeding-season there is a small fleshy horn from the base of the culmen; nostril long and narrow, pervious and placed nearly in the centre of the upper mandible; tarsus shorter than middle toe without claw but very strong; toes fringed with a lobed web; wing rounded, the second, or second and third, longest, the first equal to fifth or sixth; rectrices eighteen in number, broad and stiff, slightly graduated and equal in length to about half the wing.

Sexes slightly differing.

(2030) Heliopais personata.

THE MASKED FINFOOT.

Podica personata Grey, P. Z. S., 1848, p. 90 (Malacca).
Heliopais personata. Blanf. & Oates, iv, p. 182.

Vernacular names. *Ye Balon* (Burma).

Description.—Male. Fore-crown running back in a line over the ear-coverts, face, chin, throat and fore-neck velvety-black; the forehead and the rest of the head black surrounded, except on the crown, by a narrow line of white; posterior crown and hind-neck steel-grey, the crown with metallic reflections; sides of the neck, interscapulars and upper back light olive-brown, each feather with a metallic green edge; lower back, wings and tail light brown grading from the olive-brown; the upper tail-coverts rather paler brown; tail narrowly tipped with whitish; breast and abdomen white; flanks brown, barred with white next the abdomen; under tail-coverts barred brown and white.

Colours of soft parts. Iris dark brown; eyelids pea-green; bill bright chrome-yellow shaded with brown on the centre; legs and feet pea-green, the edges of the web yellow; in Summer the horn is highly developed, erectile and bright yellow in colour; in Winter it shrivels up and disappears.

Measurements. Total length about 600 mm.; wing, ♂ 248 to 253 mm., ♀ 232 to 241 mm.; tail 98 to 124 mm.; tarsus 46 to 51 mm.; culmen, ♂ 52 to 56 mm., ♀ 41 to 50 mm.

Female. The white line on the forehead broader; chin, throat and fore-neck white, surrounded by black, which is edged white as in the male; the black frontal band is less broad.

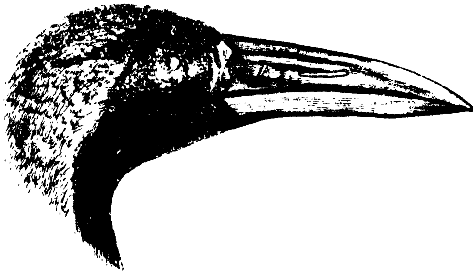

Fig. 9.—Head of *Heliopais personata.* ⅔.

Colours of soft parts as in the male but much duller, whilst the iris is yellow; there is no horn.

Young birds are like the female but have no black on the crown, whilst that surrounding the throat is mottled with white.

Distribution. Eastern Assam, Bengal, North and East of the Bay of Bengal, Burma and Malay States to Sumatra.

Nidification. Dr. Gregerson took the first recorded nest of this bird in Assam on the 24th July but the young had hatched with the exception of one infertile pigmy egg. In 1920 and subsequent years Messrs. Smith and Marlow obtained numerous nests in the flooded country of the Tharrawaddy District of Burma during the months of July and August. These latter nests were made of sticks and twigs lined with leaves and were rather massive structures of about 15″ in diameter by 6″ to a foot in depth, the egg cavity being about 8″ across and 2″ deep. They were all placed on tangled branches of trees or shrubs, in one case only a few inches above the water, in other cases as much as nine feet and, in every case, the sites selected were in flooded forest. The country where they nest is of the wildest character but the birds, which are very numerous, seem often to breed in the vicinity of the few villages which are dotted about in the jungles on the higher ground. They sit very close and would allow Mr. Marlow to get within a few inches before leaving the nest. The eggs number five to seven and are *sui generis*, though distinctly Ralline in character. In shape they are very spherical, though more oval specimens may be seen occasionally. The ground-colour is a very pale cream, in one or two clutches faintly tinged with pink. The primary markings consist of fairly large reddish-brown blotches very sparsely scattered over the whole surface, sometimes rather more numerous at the larger end. Under these are secondary markings of lavender-grey distributed like the others, sometimes more numerous, sometimes less.

Habits. The haunts of this bird both in Assam and Burma are the wildest and most inhospitable imaginable, being in the vast swamps and flooded forest areas where no one, European or native, ever goes except under compulsion. In these areas they are tame and confiding but in the Autumn, when they follow the streams out of their swamps into the open, they are very shy and alert. As a rule when seen they at once seek safety by swimming ashore and disappearing at a great pace into the densest jungle they can find. If they are fine runners, they are equally fine swimmers and divers. When undisturbed they swim high out of the water but when frightened submerge all but the head and neck. They rise like a Coot, skittering along the top of the water and hanging their legs down but, once on the wing, they fly fast and well, more like a Duck than a Coot. Their diet is omnivorous and in great part consists of small fish, freshwater shrimps and mollusca. The call is described by Smith and Marlow as sounding like water bubbling out of a bottle.

Suborder **JACANÆ.**

Characteristics those of the family *Jacanidæ*.

Family JACANIDÆ.

This group of birds has hitherto been placed in the Order *Limicolæ* but Lowe * has recently shown that they are really nearer the *Rallidæ*, a position in which the Field Naturalist would also place them without doubt. At the same time, many of their characteristics show an approach to the *Grues* and it may eventually be necessary to elevate these birds to the rank of an Order, *Jacanæ*, between the *Grallæ* and *Limicolæ*.

Schizorhinal; nostril pervious and situated slightly nearer to the base than to the tip of the bill; basipterygoid processes present; cervical vertebræ sixteen; all four toes greatly lengthened and with very long straight claws, that of the hallux being especially long; the deep plantar tendons are the same as in the three-toed birds, the *flexor longus hallucis* and *flexor perforans digitorum* uniting and then dividing again into three to supply the three front toes and supplying a short branch to the hind toe.

Two genera of this family are found in India.

Key to Genera.

A. A frontal lappet; primaries not attenuated at the end	METOPIDIUS, p. 39.
B. No frontal lappet; first and fourth primaries attenuated	HYDROPHASIANUS, p. 41.

Genus **METOPIDIUS.**

Metopidius Wagler, Isis, 1832, col. 279.

Type, *Parra ænea* Gav. = *Parra indica* Lath.

Head small; bill moderately long, straight and compressed, the culmen curved at the tip; a lappet at the base of the bill resting against the forehead and rounded behind; tail short; wing not rounded, the first and second primaries subequal and longest; a tubercular spur on the carpal joint; middle toe without claw longer than tarsus, hind claw excessively long; tarsus transversely shielded before and behind.

Sexes alike but juvenile and adult plumage greatly differing, the latter acquired by a spring moult when the bird is a year old.

A single species.

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* Lowe, "On the Systematic Position of the *Jacanidæ*," Ibis, 1925, pp. 132-147.

(2031) Metopidius indicus.

THE BRONZE-WINGED JACANA.

Parra indica Lath., Ind. Orn., ii, p. 765 (1790).
Metopidicus indicus. Blanf. & Oates, iv, p. 218.

Vernacular names. *Dal-pipi*, *Jal-pipi*, *Karatiya* (Beng.).; *Kattoi* (Purnea); *Bi* (Burma).

Description. Feathers below the eye and a broad superciliary streak from the eye to the nape pure white; remainder of head, neck, lower parts, axillaries and under wing-coverts black, glossed all over with deep green; hind-neck glossed with purple-blue and then purple, the green, blue and purple grading into one another; back, wing-coverts and innermost secondaries olive-bronze; lower back, rump and upper tail-coverts chestnut with purple reflections; greater wing-coverts, primaries and outer secondaries black, glossed with green on the outer webs; tail and under tail-coverts chestnut; vent and thigh-coverts dull brownish-black, sometimes extending on to the centre of the abdomen.

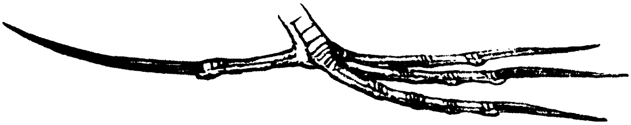

Fig. 10.—Foot of *M. indicus.* ½.

Colours of soft parts. Iris brown; bill greenish-yellow, tinged with red at the base and pure yellow at the tip; frontal lappet or shield livid red; legs and feet dull green.

Measurements. Wing, ♂ 145 to 198 mm., ♀ 152 to 186 mm.; tail 34 to 52 mm.; tarsus 65 to 80 mm.; culmen 31 to 39 mm.; mid toe and claw 87 to 106 mm. The great differences in size are not geographical.

Young birds have the crown and nape rufous-brown, darker on the forehead and centre of the crown; short supercilium dull white; hind-neck black glossed with green; interscapulars black glossed with purple; lower back and rump dull rufous barred with dusky brown, upper tail-coverts barred white and brown; tail rufous with contour-bands of black; remaining upper plumage like that of the adult; lores dull rufous; ear-coverts grey, chin white, changing to pale rufous on the neck and breast; lower breast and abdomen sullied rufous-white; flanks brown, rufous posteriorly and barred with white.

Distribution. Nearly all India, Burma, the Indo-Chinese countries, Malay States to Java, Sumatra and the Celebes. It is rare in the Southern Punjab and does not occur in the Northern Punjab, Sind or Western Rajputana.

Nidification. The Bronze-winged Jacana breeds during the Rainy Season wherever it is found, most eggs being laid in July and August. The nest is generally a rather flimsy platform of weeds, rush-stems and blades, built half-submerged on a bed of lily- or lotus-leaves, very rarely among rushes. Occasionally the nest is more bulky and well lined with dry rushes. The normal clutch of eggs is four, exceptionally as many as six, although Hume writes of finding seven. They are extremely handsome eggs. The ground-colour varies from light yellowish stone-colour to buff or rufous-brown or even to deep red-brown, whilst the markings consist of numerous long lines and intricate scrawls of black, looking as if a child had taken a pen and scribbled ink lines all over the surface. Eighty eggs average 36·4 x 25·1 mm.: maxima **39·5** x **27·0** mm.; minima **33·8** x 24·9 and 35·4 x **22·0** mm. In shape they are oval or very slightly peg-top shape and the surface is highly glossed.

Habits. The Bronze-winged Jacana is a bird of the Plains being found almost throughout these in the more wet portions where there is an abundance of water. It does not care for small ponds and village tanks, though they do visit there from time to time, preferring large swamps and lakes with reed-fringed shores and stretches of water-lilies and lotus-plants, upon which they walk about and feed. Their walk is typically Rail-like, slow and deliberate with high action of the feet and an accompanying jerk of the tail to each step. When frightened or in pursuit of prey they can run at great speed and their swimming, very high in the water, is elegant and powerful. They feed on insects of all kinds, water-snails, fish and the leaves and shoots of water-plants. Their breeding-call is a harsh grunt or crake but they utter a good many piping calls also and have a low guttural conversational note. Their flight is poor and laboured and they hang the legs down like the Rails until well on the wing.

Genus **HYDROPHASIANUS.**

Hydrophasianus Wagler, Isis, 1832, Col. 279.

Type by orig. desig., *Parra chinensis* auct. = *P. chirurgus* Scopoli.

In this genus the bill is more slender than in *Metopidius* and there is no lappet; the hind claw is shorter; the first and fourth primaries are attenuated, the first into a barbless shaft terminating in a spatulate web and the fourth prolonged into an attenuated point; the wing is furnished with a strong sharp spur at the bend. Sexes alike, both assuming a nuptial dress which is attained by a moult and not by a change in the colour of the plumage as was supposed.

The female is rather larger than the male.

A single species.

(2032) Hydrophasianus chirurgus.

THE PHEASANT-TAILED JACANA.

Tringa chirurgus Scop., del Flor. et Faun., Insubr., ii, p. 92 (1786) (China).
Hydrophasianus chirurgus. Blanf. & Oates, iv, p. 219.

Vernacular names. *Piho, Pihuya* (Hin.); *Surdal, Sakdal, Miwa, Dal-kukra, Bhepi, Jal-manjor, Chitra-Billai* (Beng. & Behar); *Balal Sauru, Newiya* (Ceylon); *Rani di-dao gophita* (Cachari).

Description.—Breeding plumage. Head, throat and fore-neck white; a certain amount of black on the occiput; back of neck pale, shining golden-yellow, edged with lateral black lines; upper and lower plumage chocolate-brown; blackish on the rump, upper tail-coverts and tail; wing-coverts white, the primary coverts with broad black tips to the inner webs; primaries black with increasingly white centres, the middle secondaries being pure white and the innermost like the back; under wing-coverts and axillaries white.

Colours of soft parts. Iris brown; bill slaty-blue, paler at the tip; legs and feet pale bluish-plumbeous.

Measurements. Wing 182 to 242 mm.; tail 145 (generally over 200) to 325 mm.; tarsus 54 to 59 mm.; culmen 25 to 29 mm.

Non-breeding plumage. Supercilia white; a line from behind this running down either side of the neck golden-yellow, a black line from the lores, through the eye and down below the yellow, expanding into a broad gorget across the breast; remainder of upper plumage light hair-brown; innermost and outermost wing-coverts white; intermediate coverts light brown barred with white and narrow black lines; quills as in Summer; lower plumage pure white.

Colours of soft parts. Iris pale yellow; bill yellow, the terminal half brown; legs and feet dull greenish to dull plumbeous.

Young birds have no yellow on the sides of the neck; the dark gorget is broken up with white; the crown is dull rufous-brown and the feathers of the upper parts are pale-edged.

Distribution. Ceylon, all India and Burma, North to Kashmir, East to South China and South to the Philipines and Java. It has been recorded from Gilgit in the extreme North-West as well as from Panji.

Nidification. The Pheasant-tailed Jacana breeds throughout the plains of India and Burma wherever there is sufficient water and also to a considerable elevation in the Himalayas, being common on the Kashmir Lakes and occuring also in the Abor and Mishmi Hills. It breeds alike in small ponds and village tanks as well as in huge swamps and lakes. The nest is like that of *Metopidius* but often very small and flimsy. The eggs are invariably four in number and the colour ranges from a pale yellow-bronze or olive-brown to a deep chocolate-purple, in every case with a high gloss. In shape they are pegtop, lying in the nest point to point like the eggs of the Snipe. One hundred eggs average 37·4 × 27·6 mm.: maxima **39·9** × 27·1 and 36·1 × **29·0** mm.; minima **34·5** × 28·9 and 34·6 × **26·0** mm.

The breeding-season is from the end of June to September, except in Ceylon, where it breeds from March to June.

Habits. Much the same as those of the preceding bird but it is usually much more confiding. It is in all its actions more elegant than the Bronze-winged Jacana and the Cacharies give it the poetical name of "The Little white water-Princess." The note is a mew like that of a cat, in addition to which it has a piping note which is rather pleasant and musical.

Suborder **ROSTRATULÆ.**

The remarkable genus which constitutes this Suborder is very difficult to place. Its natural affinities seem to be with the Rails, whilst its anatomical characters show it to be a more or less half-way house between the *Grallæ* and the *Limicolæ*. It is probably a bird which has been derived very low down from the same branch as that from which both the *Rallidæ* and the *Limicolæ* have sprung and in consequence has many of the primitive characters shown in one or the other, or both, of these two orders.

The one genus, *Rostratula*, is schizorhinal; the sternum has two notches on the posterior border as in the *Jacanæ* and *Grues*; the oil-gland is tufted as in the *Grallæ* generally as well as many of the *Limicolæ*; there are two carotids; the ambiens muscle is present and the cæca are well developed.

Family ROSTRATULIDÆ.

This genus has hitherto been placed with the *Limicolæ* in the family *Scolopacidæ*. Its affinities seem, however, to be with the Rails rather than with the Snipe and it is probably an early offshoot from the avian branch, which produced the former. It is one of the few forms of birds in which the female is the larger, brighter coloured of the sexes and the dominating partner in sexual matters.

In this genus the bill is slender and long but shorter than in most species of Snipe and not pitted at the end as it is with these birds; the tip is slightly swollen and bent down; both mandibles are grooved at the base and the nostrils basal; tarsi strong but of moderate length, the tibia partly naked and the toes long; the wings are short, broad and rather lax, the first and second primaries being longest and subequal; tail of fourteen feathers: sexes dissimilar in plumage.

There is only one genus, containing three species found in Australia, South America and in India and Africa.

Genus **ROSTRATULA.**

Rostratula Vieill., Analyse nouv. Orn., p. 56 (April 1816).

Type by mon., *Rallus benghalensis* Linn.

Characters. Those of the family.

(2033) Rostratula benghalensis benghalensis.

THE PAINTED SNIPE.

Rallus benghalensis Linn., Syst. Nat., 10th ed., i, p. 153 (Jan. 1758) (Asia, Bengal).
Rostratula capensis. Blanf. & Oates, iv, p. 293.

Vernacular names. *Ohari* (Nepal); *Kone*, *Konebatta* (Singbhoom); *Tibad*, *Pan-lawa* (Mahr., Ratnagiri); *Mail-ulan* (Tam., Madras); *Baggarjee* (L. Beng.); *Rajachaha* (Saugur); *Raja kœswatuwa* (Cing.); *Daodidap-gajao* (Cachari).

Description.—Male. Crown olive-black, with very fine bars of white and a broad median band buff; feathers round the eye and a short broad streak behind it over the ear-coverts buff, the feathers next the buff darker than elsewhere on the head; lores grey-brown, lined, barred and speckled with black and white; upper back and scapulars olive-brown with patches of dark metallic olive-green; outer webs of scapulars buff, forming two lines down the sides of the back; lower back, rump and upper tail-coverts vinous-grey, narrowly barred with black and with white spots, the tail-coverts with buff spots as well; tail the same, edged with buff at the tip; wing-coverts and inner secondaries metallic olive-brown, finely barred with black and buff and with broad buff bars and spots on the outer part of the wing; quills blue- or vinous-grey, finely barred with black, the outer primaries with broad alternate bars of black and buff on the outer webs, the inner primaries and secondaries with buff only, the bars becoming spots only on the innermost; chin and neck mottled brown and white; breast and flanks brown, the latter mottled with white and the breast edged with dark brown next the abdomen, which with the under tail-coverts is white; a buff or white band, bordered with blackish, from the breast to the scapulars; under wing-coverts vermiculated grey, black and white; axillaries pure white.

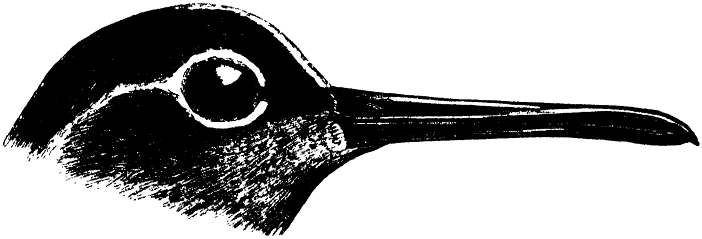

Fig. 11.—Head of *R. benghalensis*.

Colours of soft parts. Iris bright to dark brown: bill pale to darkish fleshy-brown, greenish at the base; legs and feet yellowish to olive-green, sometimes tinged brown or plumbeous.

Measurements. Wing 115 to 136 mm. (nearly always over 124 mm.); tail 36 to 45 mm.; tarsus 40 to 45 mm.; culmen 41 to 47 mm.

Female. The circle round and band behind the eye are pure white; chin, throat and upper breast rich chestnut; a broad pectoral band of blackish-brown followed by a pure white band and this again by a broken band of brown; scapulars and back with no buff markings but the underlying scapulars pure white showing through the others; wing-coverts and inner secondaries rather bright olive-green, closely barred with black and more or less tinged with reddish; remainder of plumage as in the male.

Colours of soft parts. In the breeding-season the bill is more fleshy-pink.

Measurements. Wing 130 to 146 mm.; culmen 45 to 50 mm.

Young male has the throat entirely white, the lower throat and fore-neck washed and streaked with brown.

Young female has the chestnut of the head and neck very dull and the feathers margined with dusky brown.

Nestling dull grey or buff-grey, with broad coronal and eye-streaks of rich brown; centre of back rich rufous with broad bands of black on either side and lateral bands of purplish-brown from the wings to the thighs.

Distribution. Africa, South of the Sahara to Egypt; Madagascar; Southern Asia to Southern and Central China and Japan; Malay Peninsula to Sumatra, Java, Borneo, the Philippines and Formosa. In India, Ceylon and Burma it is found, wherever the country is suitable, throughout the plains and also in the swamps and lakes of the Himalayas up to some 5,000 ft.

Nidification. The Painted Snipe breeds throughout the year but most eggs are laid during the Rains, June to September, when food is most plentiful and cover and water abundant. The female is polyandrous and probably only limits her husbands to the number of clutches of eggs she can produce for them to hatch, for, the eggs once laid, she takes no more interest in them but seeks another husband, who prepares another nest for her and then brings up her second family. The nest is a pad of grass, soft rush-blades, weeds etc. and may be placed almost anywhere within reach of water. Generally it is built on little islands in swamps or on the edges of swamps, wet ditches and ponds, whilst at other times it may be found in crops, fallow-fields or even dry grassland. The normal clutch of eggs is four but five and six are not infrequently laid. They are very beautiful; the ground varies from a yellow-stone to a bright yellow café-au-lait and they are richly marked with fine bold blotches of vandyke-brown, sometimes mixed with spots and lines of the same. One hundred eggs average 35·9 × 25·5 mm.: maxima **40·1 × 26·2 mm.**; minima **32·0 × 22·3 mm.**

The females fight for the males and challenge one another with a loud note, sounding as if someone was blowing into a bottle. Their display is a fan-like spread of the wings and tail over the head whilst the bird crouches on its breast. The display seems to be both a warning to other females or enemies and an invitation to the male, being always accompanied by a loud hissing.

Habits. This handsome little bird is resident wherever it occurs, though it has local movements due to drought, whilst it visits some of the drier areas only during the Rains. It is much more of a skulker than the Snipe but less so than many of the Rails, though it runs, swims and dives much as the latter do. It flies well but rises with hanging legs like the Rails and is weak on the wing compared with any Snipe. In suitable places it is very common and, when not breeding, sometimes collects in small flocks. In parts of Assam and Eastern Bengal a dozen to even thirty or forty birds may be met with in a day's shoot, when the males will be found to greatly outnumber the females. They feed both on leaves, shoots, grain and also on insects, worms, etc. Small crickets and grasshoppers of any size are very favourite morsels. In addition to the calls already mentioned, both sexes have a soft purring note, whilst the female, possibly the male also, has a pleasant whistling note.

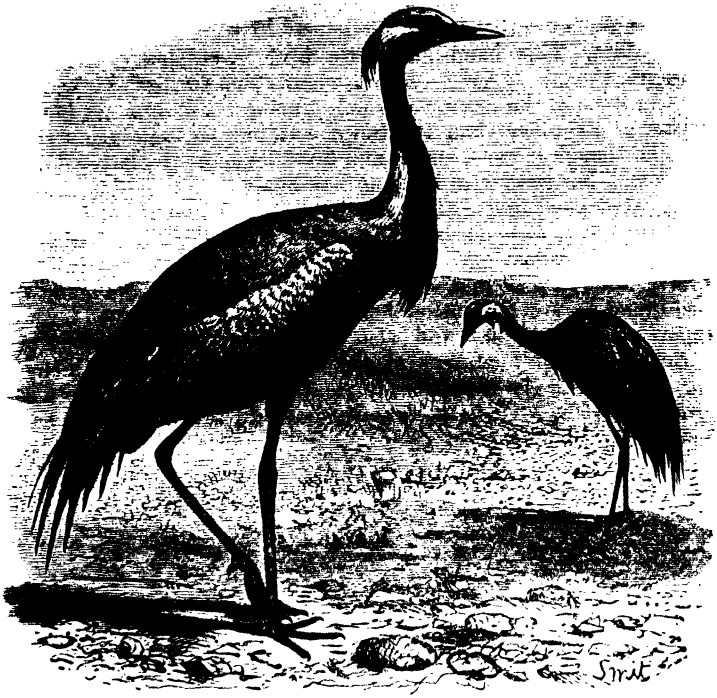

Fig. 12.—*Anthropoides virgo.*

Suborder GRUES.

Schizognathous and schizorhinal birds with 17 to 20 cervical vertebræ and, as a rule, without notches on the posterior border of the sternum; the oil-gland is tufted; cæca present; the deep flexor tendons galline; ambiens muscle present, also the semitendinosus and accessory semitendinosus; the femoro-caudal and its accessory are present in all but the one genus, *Grus*. The young are hatched clad in down and run at once.

Family GRUIDÆ.

The true Cranes are birds of large size with long necks and legs but with the bill only equal to, or but little longer than, the head. The nostril is enclosed by a membrane on the posterior side and is placed in the base of a groove, which extends about half-way up the middle of the mandible. The tail has twelve feathers and the wing eleven primaries; the tracheæ pass into a hollow space between the long walls of the sternal keel and are more or less convoluted. There is a small aftershaft.

Our Indian Cranes were divided by Sharpe into four genera—*Grus*, *Sarcogeranus*, *Antigone* and *Anthropoides*. The name *Grus* is tenable and has not to give way to *Megalornis*[*], whilst the differences between this and *Sarcogeranus* seem hardly generic. On the other hand, *Antigone*, not recognized by Blanford, is now generally accepted as sufficiently well defined to constitute a good genus.

Cranes are almost cosmopolitan in range, three genera and six species being found in India.

Key to Genera.

A. Crown of head bare; sides of head and upper neck feathered	GRUS, p. 49.
B. Crown of head bare: sides of head and neck not feathered	ANTIGONE, p. 54.
C. Crown of head feathered	ANTHROPOIDES, p. 57.

Genus GRUS.

Grus Pallas, Spicilegia Zool., iv, p. 1 (1767).

Type by taut., *Ardea grus* Linn.

In the genus *Grus* the crown of the head is bare but the sides of the head and neck are feathered and not bare as in *Antigone*. The wings are long with the inner secondaries lengthened and considerably exceeding the primaries: tail short; the tibia naked on the lower half; toes short and strong with short, blunt claws. The sexes are alike in plumage.

Key to Species.

A. Plumage grey, tail grey.	
a. Throat grey; white on neck confined to a line down the sides	*G. grus*, p. 50.
b. Throat white; greater part of sides and back of neck white	*G. monachus*, p. 51.
B. Plumage grey; tail black	*G. nigricollis*, p. 52.
C. Plumage white	*G. leucogeranus* p. 53.

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[*] See Smith, Misc. Coll., vol. iv, no. 5, p. 21 (1728), Opinion No. 103. Oberholser's statement given in full.

Grus grus.

Ardea grus Linn., Syst. Nat., 10th ed., i, p. 153 (1758).

Type-locality: Sweden.

The typical form differs from our Indian bird in its darker plumage, more especially in the darker colour of the inner ornamental secondaries.

(2034) Grus grus lilfordi.

THE EASTERN COMMON CRANE.

Grus lilfordi Sharpe, Cat. B. M., xxiii, p. 252 (1894) (E. Siberia).
Grus communis. Blanf. & Oates, iv, p. 186.

Vernacular names. *Kuranch Kurch* (Hind.); *Kunj* (Sind.); *Kullam* (Duncan); *Kulangi* (Tel.).

Description. Lores and crown to nape bare black skin with scattered black hairs; a broad band of bare skin brick-red to red across the nape, the black hairs even more scarce than on the crown; a patch of grey feathers behind the bare red spaces; sides of face grey; ear-coverts, sides of head and neck white, running back behind the grey neck-patch and down the hind-neck; winglet, primaries, the terminal portions of the primary coverts and the tips of the long secondaries black; chin, throat and fore-neck dark slaty-brown; remainder of plumage pale, almost silvery-grey; tail slightly darker grey, blackish towards the tip.

Colours of soft parts. Iris orange-red to red-brown or crimson; bill dull glaucous or dingy green, paler and more yellow towards the tip; legs and feet black, the soles paler, more brown, greenish or even fleshy.

Measurements. Wing 533 to 608 mm.; tail 192 to 205 mm.; tarsus 225 to 258 mm.; culmen 105 to 118 mm.

Young birds have the edges of the grey feathers isabelline or rufescent-isabelline; the sides of the head and neck and hind-neck pale rusty-rufous; feathers cover the red bare skin on the nape, whilst the crown also is more or less covered with the same; the drooping inner secondaries are wanting.

Half-grown birds have the edging to the feathers more rufous and more conspicuous and the whole crown and neck clothed with rusty-coloured feathers.

Chicks in down are pale golden-fuscous above; a broad line of deeper tint runs down the centre of the back and two narrower less-defined lines from the wings down each side of the body; centre of crown and a mark above the eye dark golden-rufous; below sandy-buff, albescent on the chin and fore-neck and pale on the centre of the abdomen.

Distribution. The Eastern Common Crane breeds in Eastern Siberia from the Yenesei basin eastwards and in Turkestan. In winter it migrates South to China and practically the whole of Northern India. It is extremely common in North-West India and extends South through the greater part of the Bombay Presidency and the Deccan. It has occurred in Southern Orissa and I have seen it as far east as Lakhimpur and Cachar in Assam on several occasions.

Nidification. Buturlin gives the breeding-range of this Crane as Altai, Turkestan, Dauria to Manchuria and North from Siberia to the 66th degree of latitude. The nest is said to be a big untidy heap of all kinds of rubbish placed on the ground in swamps and marshes, whilst the eggs, two in number always, are not distinguishable from those of the Common Crane. The few eggs I have seen varied in ground-colour from pale greenish- or yellowish-grey to olive or yellow-brown, sparingly marked with reddish-brown blotches and secondary markings of light reddish and grey. Six eggs average 93·8×59·6 mm.: maxima 95·2×59·9 mm.; minima 90·2×57·0 mm.

The breeding-season is May and June.

Habits. The Eastern Common Crane is a regular migrant to Northern India in very great numbers, arriving in October and leaving again in March and April. It is a shy wary bird, passing most of the day either on sand-banks in wide open rivers or in marshes and shallow lakes, feeding during the early mornings and late evenings. The call is a fine trumpet-like sound, uttered when the bird is on the wing and is audible from a great distance. When flying for any distance these birds keep in a V-shaped line but, when merely moving from one feeding-ground to another, they keep to no special formation. They are almost omnivorous in their diet but are mainly vegetarian, feeding on green crops and often doing much damage to them. They are among our most excellent of birds for the table.

(2035) Grus monachus.

THE HOODED CRANE.

Grus monacha Temm., Pl. Col., pl. 555 (1835) (Yesso and Korea).

Vernacular names. None recorded.

Description. Lores, forehead and fore-crown covered with black bristles; remainder of head and neck pure white; the rest of the plumage dark slaty-grey, more or less tinged with brown, especially on the upper parts; edges of the feathers both above and below fringed with grey, these fringes almost disappearing in abraded plumage; quills, the decomposed ends of the drooping secondaries and the tail blackish-brown.

Colours of soft parts. "Iris yellow; bill greenish, tinged with red towards the base; feet dull reddish" (*Blyth*).

Measurements. Wing 510 to 545 mm.; tail 155 to 180 mm.; tarsus 208 to 220 mm.; culmen 92 to 110 mm.

Young birds appear to be a much paler grey; the head is well covered with bristly feathers, grey with black shafts on the crown, whiter on the forehead and black on the lores and in a patch on each side of the forehead.

Distribution. Breeding in Japan and Eastern Siberia, migrating South to China in Winter. The only quite certain record of this Crane's occurrence in India is that of a young bird shot by me in North Cachar in December 1899 but I saw several of these Cranes on two occasions on the lower reaches of the Subansiri in N. Lakhimpur. Hume saw a small flock of Cranes in Manipur which must have been this species and other probable occurrences are recorded by Anderson at Ponsee, West of Bhamo and by Couchman near Myothit in Upper Burma.

Nidification. I can find nothing on record beyond the statement that it undoubtedly breeds in Dauria, Amur and in Eastern Siberia and that it arrives in its breeding-haunts in April and leaves again in August. It has bred in captivity in England.

Habits. This Crane is said to haunt open plains and marshes but to be nowhere very numerous. Even when migrating, according to David and Oustalet, it collects only in very small parties or pairs. Those I saw in India were in small flocks of seven and eight and were on the move. When disturbed they at once formed in line in flight, trumpeting loudly at the start.

(2036) Grus nigricollis.

THE BLACK-NECKED CRANE.

Grus nigricollis Przewalski, Mougol. Tang., ii, p. 135 (1876) (Koko Nor).

Vernacular names. *Tung-du*, *Trung-dung* (Tibet).

Description. Lores and crown dull red bare skin, sparsely covered with coarse black hairs; a patch of feathers below and behind the eye white, sometimes extending in a narrow line over the eye; rest of head and neck black; wing-quills dull black; the innermost prolonged secondaries black; inner webs of outer secondaries black or mottled with black and many of the greater coverts over the secondaries more or less black on the inner webs; scapulars sometimes with a little black mottling on their terminal quarters; remainder of plumage pale ashy-grey, the shafts of the feathers of the upper plumage showing as fine darker brown lines; tail dark blackish-grey, tipped and edged paler grey.

Colours of soft parts "Iris yellow; bill horny-grey or horny-green, more yellow towards the tip; legs and feet black" (*Ludlow*).

Measurements. Wing 625 to 668 mm.; tail 234 to 247 mm.; tarsus 223 to 252 mm.; culmen 124 to 137 mm.

Distribution. Ladak, Tibet, Setchuan and Yunnan, where it was procured by Forest.

Nidification. The Black-necked Crane's nest and eggs were first discovered by Capt. R. Steen in 1905-6 at the Hramtso Lake in Tibet at an altitude of about 14,700 feet. Later Capt. J. Kennedy, Major F. M. Bailey and others found it breeding in some numbers in various Tibetan lakes, whilst Osmaston also found it breeding around the Ladak lakes.

The nest varies considerably. Often it is just a scratching in the ground with a very scanty lining; at other times a more pretentious nest is made and quite a pile of grass, rushes and other weeds is accumulated with a good depression in the centre for the eggs. The bird breeds on the same ground as the Bar-headed Goose and sometimes its own nest is surrounded by the large down-covered nests of these birds. The eggs are two in number and closely resemble those of the Common Crane except in being much bigger. Most of those I have seen are rather dingy olive-brown or olive-green eggs scantily blotched with dull reddish-brown or purplish-brown with secondary, or underlying, markings of purple-grey or reddish-grey. Twelve eggs average 101·2 × 64·1 mm.: maxima **105·0** × 63·4 and 103·2 × **69·1** mm.; minima **96·4** × 64·1 and 99·3 × **59·6** mm.

The breeding-season is from the end of May to the first week in July, most eggs being laid between the 25th of May and 15th of June.

Habits. Walton found this Crane very wild and difficult to approach on the Gyantse plateau but much more tame round about Lhasa, though it seems equally common in either place. It keeps entirely to the shores and islands of the lakes and to the wide open plateaus, feeding both on shoots and on all kinds of insects, small reptiles etc. Ludlow describes its call as very like that of the Common Crane and its flight is said to be powerful and graceful. It does not apparently collect in flocks.

(2037) Grus leucogeranus.

THE GREAT WHITE OR SIBERIAN CRANE.

Grus leucogeranus Pallas, Reise Reich. Russ., ii, p. 714 (1773) (Irtin and Ob Rivers); Blanf. & Oates, iii, p. 187.

Vernacular names. *Kare-Khar* (N.W.P.); *Tunhi* (Oudh); *Chini Kulang* (Hansi, Hind.); *Bursnuch* (Behar).

Description. Winglet, primary coverts and primaries black; forehead, fore-crown, face and sides of head bare except for a few white bristles; remaining plumage pure white.

Colours of soft parts. Naked skin of head reddish; iris bright pale yellow; bill umber-brown; legs and feet pale reddish-pink (*Hume*).

Measurements. Wing, ♂ 635 to 645 mm., ♀ 538 to 620 mm.; tail 205 to 218 mm.; tarsus 275 to 285 mm.; culmen 185 to 197 mm.

Young birds have the whole head clothed with white feathers and, according to Hume, have the white plumage tinged with buff.

Distribution. South-Eastern Europe, Asia Minor, through Siberia to Japan. In winter migrating to India and N. China.

Nidification. There is very little known of the breeding of this fine Crane. It is said by Godlewski to arrive at its breeding-haunts in April, leaving again in September. Dresser gives the following as known breeding-places: Russia on the lower Ural and in the Perm Government; in the Tolol and Targai Governments; in the Northern parts of Turkestan; Dauria, on the Vilnui River; in the delta of the Kolyma; Amur, Ussuri to N.E. Mongolia. As regards its nest Kuschel when forwarding me two eggs writes: "from nests of rushes and reeds on the ground by a lake." The eggs are not distinguishable from those of the Common Crane, though they may average larger. Four measure 98·9 × 54·6; 95·0 × 62·0; 92·7 × 61·7 and 101·3 × 63·2 mm. Two eggs only are laid and the breeding-season seems to be June.

Habits. This beautiful Crane is not uncommon in North-West India but always arrives in small flocks. It has been recorded as far South and East as Delhi and once as far East as Behar by Inglis. These birds are the wariest of all Indian Cranes, keeping to extensive marshes, where they wade about or sleep all day in the shallow water. They feed more exclusively on water-plants than do most Cranes and do not resort to cultivated fields for this purpose. They fly in the usual \/-shaped line but soar much less than Lilford's Crane does. Their call has been syllabified as "karekhur," rapidly but rather softly repeated and they have no trumpet call.

Genus ANTIGONE.

Antigone Reichenb., Handb. Sp. Orn., p. xxxiii (1852).

Type by orig. desig., *Grus torquata* Vieill. = *Ardea antigone* Linn.

The genus *Antigone* differs from *Grus* in having nearly the whole head and neck bare; the hind-neck, face and chin covered with coarse granulations.

Antigone antigone.

Key to Subspecies.

A. Paler; a ring round the neck and long inner secondaries white	*A. a. antigone*, p. 55.
B. Darker; no ring round the neck and long inner secondaries grey	*A. a. sharpei*, p. 56.

(2038) Antigone antigone antigone.

THE INDIAN SARUS CRANE.

Ardea antigone Linn., Syst. Nat., 10th ed., i, p. 142 (1758) (India, *Hartert*).
Grus antigone. Blanf. & Oates, iv, p. 188.

Vernacular names. *Saras, Sirhans* (Hind.); *Khur-sang* (Assam).

Description. A patch of grey-white feathers on the oral region; a ring of bristly black feathers round the neck and on the throat; a few coarse bristles on the lores; remainder of head and neck bare, the crown smooth, the rest of the naked parts covered with coarse granulations; a ring of white feathers next the base of the bare neck; winglet, primary coverts and primaries black; the remainder of the plumage pale grey, becoming almost white on the lengthened inner secondaries.

Colours of soft parts. Iris orange; bill pale greenish-horny with dark tip; legs fleshy-red to livid-red or red; bare skin of crown and lores ashy-green or glaucous-green; the papillose skin of head and neck orange-red, becoming much deeper and brighter in the breeding-season.

Measurements. ♂ wing 670 to 685 mm.; tail 255 to 263 mm.; tarsus about 310 to 355 mm.; culmen 172 to 182 mm.; ♀ rather smaller wing 625 to 645 mm.

Young birds have the whole neck and head covered with short buff, or rusty-buff, feathers.

Nestlings are covered with rich deep brown down above, more rufous and lighter on sides and on the head and paler below.

Distribution. Northern India from the Indus to Western Assam (*Gowhati*): South to Bombay Presidency on the West as far as Khandesh and to the Godavery River on the East.

Nidification. The Sarus Crane breeds after the rains have well set in, that is to say from July onwards. Most eggs are laid between the middle of that month up to the end of August but many are laid in September. From then to the end of November casual nests and eggs may constantly be found, whilst I have one clutch from the Central Provinces taken in March, Pershouse took a nest with a single egg in December and Capt. E. O'Brien found a newly-hatched young one on the 12th of February. The birds generally select for their nesting-site some piece of ground entirely surrounded by water or by swampy marsh-land but occasionally they will nest in comparatively dry open places. Concealment never seems to be aimed at, rather they choose a place from which they can themselves see danger from afar off. Jackals and other vermin have no terror for these birds, which can protect eggs and young so long as they can see their enemies coming and get back to their nests in time. Even of man they have but little fear.

The nests vary considerably in size, those on dry ground being only a few inches high, whilst those built in swamps may be as much as three feet high and nine feet across. The eggs number two or one only and, even when two eggs are laid, it is but seldom more than one young is reared. The ground-colour of the eggs is white, rarely tinged with green or pink; a few eggs are unspotted but most are sparsely blotched with reddish, deep reddish-brown or purple-brown, with others underlying them of lavender or reddish-grey. In shape they are long pointed ovals, the texture coarse and the surface pitted but highly glossed. One hundred eggs average 104·4 × 64·3 mm.: maxima **113·2** × **69·8** mm.; minima **93·2** × 65·0 and 105·5 × **53·8** mm.

Habits. The Sarus Crane is resident wherever it occurs and is always to be found in pairs usually accompanied by the last-hatched young. They are most affectionate birds, pairing for life, and if one is killed the grief of the other is quite distressing. They are essentially birds of the well-watered open plains and avoid hills, forested country and desert-lands. Their flight is powerful but they rise slowly and seldom fly at any great height from the ground, so that the sound of their powerful wings can be heard from a considerable distance. Like all Cranes they indulge in much dancing, more so in the breeding-season than at other times, which is much less graceful than their dignified quiet walk. They eat grain, green crops and aquatic plants, frogs, lizards etc., feeding both in shallow water and in fields. Their call is a very fine trumpet, uttered chiefly in the mornings and evenings, whilst two birds of a pair if feeding apart will constantly call to one another through the night. If forced to move locally, owing to drought or other cause, they sometimes collect in small flocks and when moving then seem to adopt the usual V-shaped flight.

(2039) Antigone antigone sharpei.

THE BURMESE SARUS.

Grus sharpii Blanf., Bull. B. O. C., v, p. 7 (1895) (Burma); Blanf. & Oates, iv, p. 189.

Vernacular names *Gyo-gya* (Burm.); *Kur-sang* (Assam); *Wolnu*, *Woinuren* (Manipur).

Description. The plumage generally is rather darker than in the preceding race. There is no white ring of feathers at the base of the neck and the inner secondaries are practically the same colour as the back.

Colours of soft parts as in the Indian Sarus.

Measurements. Wing 600 to 675 mm.

Distribution. Assam East of Kamrup, Burma, Siam and Cochin China. It also occurs in the Malay Peninsula.

Nidification. Nest and eggs of this Crane so exactly resemble those of the preceding bird that no further description of them is needed. The country in which they are found, however, sometimes differs in being much more forested. Wardlaw Ramsay and Oates found it laying in August and September but in Assam we took eggs in June and July. Its early breeding in Assam may be due to the early breaking of the Rains in that province and to the naturally wet and marshy nature of the country. The eleven eggs I have seen average 101·1 × 63·8 mm.; maxima 108·8 × 63·8 and 103·6 × 68·0 mm.; minima 97·3 × 64·8 and 98·5 × 58·5 mm. I have seen no pure white eggs of this race. Birds from which I took eggs in Margherita made no defence of the nest and no protest beyond trumpeting as they flew away.

Habits. Quite similar in most respects to those of the preceding race but it is often found in marshes and plains of no great extent near forest and it seems to be a far more shy, wild bird, very wary and very hard to approach close enough for a shot. I have seen them occasionally in Lakhimpur feeding in the rice-fields in pairs but always on the look out and always rising long before one could possibly shoot at them. They seemed to rise far more easily than their Indian cousins, a few strides forward with spread wings and they were away and soon mounted two or three hundred feet into the air. Their high-flying propensities are no doubt due to their living in more forested countries than the Indian birds. Their beautiful trumpet call is that of the genus and is a fine sound when it rings out on the early dawn of a clear Indian winter morning.

Genus ANTHROPOIDES.

Anthropoides Vieill., Analyse, p. 59 (1816).

Type by mon., *Ardea virgo* Linn.

In this genus the head is feathered throughout and there are long white plumes springing from behind the ear-coverts; the feathers of the lower neck are long and lanceolate, whilst the inner secondaries are much lengthened but not disintegrated as in *Grus*. The bill and legs are shorter in proportion than they are in that genus.

(2040) Anthropoides virgo.

The Demoiselle Crane.

Ardea virgo Linn., Syst. Nat., 10th ed. i, p. 141 (1758) (*In oriente.* Restricted to India).
Anthropoides virgo. Blanf. & Oates, iv, p. 190.

Vernacular names. *Karkarra* (Hind.); *Ghanto* (Nepal); *Karkuchi* (Mahr.); *Kallam* (Deccan); *Garara* (Uriya); *Wada-Koraka* (Tel.); *Kar-koncha* (Can.).

Description. Fore-crown to nape grey; patch below the eye, a line over the ear-coverts and long aigrette behind them pure white; remainder of head and neck black; the feathers of the lower fore-neck very long and lanceolate, falling over the breast; winglet, greater coverts and wing-quills blackish; ends of lengthened inner secondary plumes black, grading into the pale French grey of the rest of the plumage; the grey of the upper plumage extending on to the base of the hind-neck.

Colours of soft parts. Iris red-brown (possibly young birds) to crimson or red; bill pale greenish with a red tip; legs and feet black.

Measurements. Wing 450 to 530 mm.; tail 165 to 182 mm.; tarsus 170 to 187 mm.; culmen 65 to 70 mm.

Young birds are like the adult but have the head wholly grey; the black of the neck is browner behind, more grey in front and there are no lengthened plumes; wings coloured as in the adult but the inner secondaries only slightly lengthened.

Distribution. Breeding in Southern Europe and the high plateaus of Algeria; Central and Northern Asia as far East as Western Mongolia. In Winter South to Northern Africa, Mesopotamia, Palestine and India. In the last-mentioned country it has occurred as far South as Kollegal in Coimbatore but it is seldom seen South of the Deccan. East it extends through Eastern Bengal and Assam to the greater part of Burma but is not common East of Behar.

Nidification. Very similar to that of the other Cranes though Dybowski says that in Dauria it nests on the rocky banks of rivers and even on bare mountains, making a nest of small stones. The breeding-season lasts from the middle of May to the middle of July and two eggs, or exceptionally three, are laid, which are small replicas of those of the Common Crane, though longer and narrower in proportion. One hundred and twenty eggs average 83·3 × 53·1 mm.: maxima **91·4** × 55·1 and 84·2 × **56·6** mm.; minima **74·1** × 48·5 and 78·0 × **47·0** mm.

Habits. The Demoiselle Crane arrives in India about October, the first flights passing over North India straight to the Deccan. They return in March and April. On arrival and before leaving they assemble in immense numbers and Phillips mentions seeing an assembly which ran like a broad band 1½ miles long.

In flight, voice, diet and fondness for dancing this Crane is quite typical of the family. Here in India it forms a first-rate object for a stalk and fully deserves a high rank among Game-Birds, for there are few more difficult to bring to bag and equally few more excellent for the table.

Suborder OTIDES.

The Bustards, although nearer to the Cranes than to any other group of birds, approach the *Lari-Limicolæ*, or Plovers, in many respects and seem to be linked with the latter through the *Burhinidæ* or Stone-Plovers.

They are schizognathous and holorhinal, with 16 or 17 cervical vertebræ and with two small notches on each side of the posterior border of the sternum; there is no oil-gland; the cæca are long; there is no hallux, or hind-toe, and the flexor tendons simply unite and then divide into three to supply the three front toes; the ambiens muscle, accessory femoro-caudal, semi-tendinosus and accessory tendinosus muscles are present; the femoro-caudal is wanting.

Family OTIDIDÆ.

In this, the only family of the Suborder, the bill is shorter than or equal to the head in length; tail-feathers 16 to 18; an aftershaft is present; primaries 4 and no fifth secondary; no bare tracts on the neck; the tarsus and bare portion of the tibia are covered with small scales; the three toes are short, stout and scutellated above; the soles are very broad and the toes short and blunt. Males of some of the species have an inflatable gular pouch connected with a small opening beneath the tongue.

The family is represented throughout Europe, Asia, Africa and Australia, whilst six species, referred here to six genera, are found within the limits of this work.

Key to Genera.

A. No ruff. Sexes differing in size or breeding plumage, or both.	
a. No crest in females and non-breeding males.	
a'. Tarsus about equal to ¼ length of wing.	
a^2. Size large, wing over 450 mm.	OTIS, p. 60.
b^2. Size small, wing under 300 mm. ..	TETRAX, p. 62.
b'. Tarsus equal to ⅓ length of wing.	
c^2. A seasonal change of plumage	SYPHEOTIDES, p. 68.
d^2. No seasonal change of plumage	HOUBAROPSIS, p. 71.
b. A crest at all times in both sexes	CHORIOTIS, p. 64.
B. A ruff on each side of neck. Sexes alike..	CHLAMYDOTIS, p. 66.

Genus OTIS.

Otis Linn., Syst. Nat., 10th ed., p. 154 (Jan. 1758).

Type by mon., *Otis tarda* Linn.

In this genus the bill is shorter than the head and broader than high at the base; tarsi about equal to ¼ the wing; wings ample, rounded, the third quill usually longest; no crest or ruff, though in the typical species the male has long bristly feathers with few and short webs on each side of the throat.

Otis tarda.

Otis tarda Linn., Syst. Nat., 10th ed., p. 154 (Jan. 1758).

Type-locality: Poland.

The typical form differs from that found in India in being darker grey on the head and neck and in having less grey on the wings. I cannot on the material available separate *dybowskii* and *korejewi* and our Indian birds are not distinguishable from the former.

(2041) Otis tarda dybowskii.

THE EASTERN GREAT BUSTARD.

Otis dybowskii Taczanowski, Journ. f. Orn., 1874, p. 331 (Dauria).
Otis tarda. Blanf. & Oates, iv, p. 493.

Vernacular names. *Deo-dagh* (Chitral).

Description.—Male. General colour above sandy-rufous, broadly banded across with black, most strongly so on the back and scapulars; upper tail-coverts and tail light bay or vinous-chestnut, barred with black; tail-feathers tipped with white, the outer with white bases, the outermost nearly all white with black tips; lesser wing-coverts like the back but the black bars less close; remainder of wing-coverts white powdered with grey on the terminal portions; quills brown with white bases, the primaries whity-brown with white shafts and the outer webs and tips blackish; outer secondaries blackish with white bases, the white increasing in extent until the innermost long ones are all white, the shorter being like the back; head, neck and throat light grey tinged with rufous on the hind-neck, where there are numerous narrow black bars; elongate bristly grey feathers on either side of the chin and lower throat orange-chestnut, forming a band across the fore-neck, which is washed with light grey; sides of the neck with numerous small black bars; sides of uppes breast sandy-rufous barred with black remainder of under plumage pure white.

Colours of soft parts. Iris dark brown; bill plumbeous with a black tip; legs and feet earthly-brown or greenish-brown; claws black.

Measurements. Wing 595 to 635 mm.; tail 210 to 235 mm.; tarsus 142 to 150 mm.; culmen 41 to 47 mm.

Female much smaller than the male. The chestnut pectoral band of the male is absent, there being only patches of chestnut under the shoulders of the wing. It has no whiskers.

Measurements. Wing 455 to 495 mm.; tail 178 to 210 mm.; tarsus 113 to 126 mm.; culmen 35 to 40 mm.

Young of the typical form are like the female but duller and paler, the white of the wings is much marked with black; the bastard wing is barred with rufous and brown and there is a certain amount of rufous on the greater wing-coverts.

Nestling probably like that of the European Bustard covered with light down mottled with black.

Distribution. Transbaikalia, South-East Altai and Mongolia to Manchuria. In India it has occurred about half a dozen times; the first in 1870 at Mardan; next, of 25 seen, two young females were shot near Mardan in January 1911; the same year one was shot in Jacobabad in Sind and a fifth was procured by Capt. Lyall in Chitral, whilst, finally, one was killed at Peshawar on the 1st of December, 1917. All six specimens were young birds.

Nidification. Apparently nothing on record. A pair of eggs and a single one sent me by Smirnoff from Eastern Manchuria are as one would expect, just like those of the common European bird. The ground-colour is an olive-green in all three; in the pair the markings are well-defined olive-brown and blackish-brown blotches, sparsely scattered here and there over the whole surface with still more scanty secondary marks of grey. In the third egg the markings are largsr and more numerous but less distinct and all olive yellow-green in colour. They measure 80·0 × 52·0; 80·0 × 53·3 and 75·3 × 55·9 mm., and were all taken on the 12th of May, 1923

Habits. The Eastern Great Bustard is a very common bird in North China and Manchuria, where it haunts the huge open plains devoid of all cover except stunted bushes and coarse grass. David and Oustalet say that they collect in herds, or droves, of fifteen to twenty birds and that they are very shy of man. The flight of these grand birds is powerful and fast, though the deliberate wing-beats are very deceiving; they rise easily but generally run or walk a few steps against the wind before springing into the air. Their diet is omnivorous—grain, seeds and shoots of plants, lizards, snakes, frogs and all kinds of insects. The European Bustard in former times was considered a great delicacy but the Chinese consider the flesh of the Eastern bird to be "mediocre" only.

Genus TETRAX.

Tetrax Forster, Syn. Cat. Brit. Birds, p. 20 (1817).

Type by taut., *Otis tetrax* Linn.

This genus is now generally accepted by systematists. The birds are much smaller than in the preceding genus and the sexes are almost the same in size instead of having the males greatly exceeding the females. The various ornamental differences between the various Bustards hardly seem to be of generic value. The structure of the wing of *Tetrax* is remarkable, the fourth quill being narrowed on the outer web in the middle and on the inner web at the base and shorter than the primaries on either side of it.

Tetrax tetrax.

Otis tetrax Linn., Syst. Nat., 10th ed., i, p. 154 (1758).

Type-locality: France.

The typical form is lighter on the upper plumage, more sandy and more reddish than the Eastern one, as well as being rather larger.

(2042) Tetrax tetrax orientalis.

THE EASTERN LITTLE BUSTARD.

Otis tetrax orientalis Hartert, Nov. Zool., p. 339, pl. ii (1916) (Sarepta).
Otis tetrax. Blanf. & Oates, iv, p. 193.

Vernacular names. *Chota tilur*, *Obara* (Punjab); *Kum-tukosi*, *Turki*, *Charaz* (Baluchi).

Description.—Male in breeding plumage. General colour above sandy-buff, coarsely vermiculated with black and with black blotches in the centre of some of the feathers; rump greyer than the back and freckled with whitish instead of sandy-buff; upper tail-coverts white or white slightly mottled with black; wing-coverts like the back but with fewer vermiculations; lesser and median coverts white at the tips and freckled with black: external coverts, bastard wing and greater coverts white, the inner slightly speckled with blackish; primary coverts blackish, narrowly tipped with white; quills white, blackish near the ends and white-tipped; outer primaries blackish with white bases, the white increasing towards the secondaries; innermost secondaries like the back; tail-feathers white, with four bars of black and speckled with blackish on the terminal half; the outer feathers broadly tipped with creamy-white; crown, nape and hind-neck brown, the feathers streaked and edged with sandy-buff and mixed with a few blue-grey feathers; lores and sides of crown pale sandy-buff streaked with brown; feathers round the eye creamy-buff; sides of head and throat bluish-grey, bordered by black and then by white, the two bands running down the sides and forming a gorget across the neck; rest of neck black; a band of white completely circling the lower neck, followed by another pectoral band of black; sides of upper breast sandy mottled with black; remainder of lower plumage pure white.

Colours of soft parts. Iris light yellow to orange, browner in the young; bill blackish, tinged with grey, green horny or bluish-grey, greenish or yellowish at the base; tarsus yellow or greenish-yellow to yellowish-brown.

Measurements. Total length about 500 mm.; wing 241 to 256 mm. (236 to 252 mm., *Hartert*); tail 102 to 125 mm.; tarsus about 55 to 66 mm.; culmen about 38 to 40 mm.

Female. Whole upper plumage like the back of the male in Summer but more boldly and regularly marked with black, the black markings on the crown forming bars; wing-quills like those of the male but more marked with black; chin and upper throat dull buff or brownish-white; the fore-neck the same streaked with black and buff, the streaks finer on the sides of the head; breast pale dull buff barred with black; remainder of lower parts white, the flanks with black shafts and a few black spots.

Measurements as in the male. Wing 242 to 260 mm. (*Witherby*).

Male in Winter. Like the female but with finer vermiculations. The black crescentic markings on the lower breast are ill defined and irregular. The nuptial plumage is assumed by a moult of the body plumage.

Young birds have the breast more heavily barred with black; the wing-quills are more or less freckled and mottled with buff, especially at the tips; white, everywhere else on the wings suffused with buff.

Nestlings. Barred and freckled everywhere with sandy-buff and blackish-brown; a black line down centre of hind-neck and upper back; throat and sides of head and neck more definitely blotched and streaked with black; underparts sandy-buff.

Distribution. Eastern Germany and Italy to Western Siberia, Turkestan and Afghanistan, South in Winter to N.W. China, Egypt etc. In India it is a common visitor in the extreme North-West or Trans-Indus country but rare South and West of this. It has occurred occasionally in Kashmir.

Nidification. The breeding-season of this little Bustard is from the middle of May to the end of June, a few eggs being laid in April and others as late as July, The nest is a rather scanty pad of grass, or grass and weeds, placed on the ground among weeds, long grass or, rarely, in growing crops. The hollow selected may be either natural or one made by the birds. The eggs number three or four, very seldom five, and are in shape almost spheroidal. The ground-colour is olive-green of varying shades, olive-brown or dark buff marked with blotches and smears, ill defined and irregular, of pale yellowish and reddish-brown, often so faint that the eggs appear unicoloured. Seventy-six eggs (58 Witherby) average 50·9×38·2 mm.: maxima **57·7**×35·2 and 51·1×**41·6** mm.; minima **46·5**×35·8 and 57·7×**35·2** mm.

Habits. In parts of the Frontier Province and British Baluchistan this "Butterfly Houbara" sometimes winters in sufficient numbers to enable bags of ten or a dozen couples to be shot in a day but until recently they were more hunted with Falcons than shot. They are shy, wary birds but in the great heat of mid-day sometimes lie very close in good cover. Their flight is more like that of the Partridge than that of the Great Plover; the wing-beats are very rapid and make a whirring noise in flight. Their food is as varied as that of the Great Bustard but they themselves are better to eat than that bird. Their call has been syllabified as "trec trec."

Genus CHORIOTIS.

Choriotis Gray, Cat. Gen. Subgen. Birds, p. 109 (1855).

Type by orig. desig., *Otis arabs* Linn.

As the generic name *Eupoditis* cannot be used for our Indian bird, the above name must be employed.

The genus can be distinguished from all other Indian genera by its great size, black-crested head and lengthened feathering of the throat and fore-neck; the beak is longer in comparison than in *Otis* or *Tetrax*, as also are the legs; the wings are very long and pointed.

The sexes are alike, but the male is much bigger than the female.

(2043) Choriotis nigriceps.

THE GREAT INDIAN BUSTARD.

Otis nigriceps Vigors, P. Z. S. (1830–31), p. 25 (2nd March, 1831) (Himalayas).
*Eupodites edwardsi**. Blanf. & Oates, iv, p. 195.

Vernacular names. *Ghorar* (Khatiawar); *Tugdar* (Punjab); *Gurayin* (Hariana); *Sohun*, *Gughunbher*, *Hukna* (Hin.); *Serailu* (Hin., Nerbudda); *Bherar* (Saugur); *Hum* (Mahr.); *Mardonk*, *Maldhonk*, *Karadhonk*, *Karlunk* (Deccan); *Tokdar* of Mahomedan Falconers; *Gurahna* (Sind); *Bat-meka*, *Bat-myaka* (Tel.); *Batta-mekha* (Yanadi); *Gunad* (Pardi); *Kanal-myle* (Tam.); *Heri-hukki*, *Arl-kujina-hukki*, *Yereladdu* (Can.); *Dhorm chiriya* (Mizapur).

Description.—Male. Crown from bill to nape black, some white stippling on the forehead and the nape mixed black and white;

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* The name *Otis edwardsi* Gray, Ill. in Zool., i, p. 59, pl. ix (Dec. 2nd, 1831) is later than *Otis nigriceps* of Vigors and cannot therefore be used.

remainder of head and neck white, pure in old birds, faintly barred with brown or brownish-black in younger individuals; back, scapulars, inner secondaries, lesser wing-coverts, rump and upper tail-coverts deep buff, finely vermiculated with black; median wing-coverts dark greyish or brownish-black, tipped with white; greater coverts deep grey, edged black and tipped with white; primaries dark brown, becoming more grey on the innermost; outer secondaries dark grey, these and the primaries tipped with white and the inner ones marked with white on the inner web; tail like the back but more grey, with a broad terminal band of blackish-brown and the outermost one or two pairs of feathers tipped white; a broad black band across the breast, sometimes continuing round to the hind-neck; flanks dark grey; under tail-coverts, vent and thigh-coverts mixed black and white; thigh black and white or all black, rest of under plumage white.

Colours of soft parts. Iris pale to bright yellow; bill greyish-white to greyish-brown, dusky at tip and base and yellowish on lower mandible; legs yellowish-creamy, sometimes tinged fleshy, grey or plumbeous.

Measurements. Total length about 1300 to 1500 mm.; wing 614 to 762 mm.; tarsus about 190 to 208 mm.; culmen about 85 to 95 mm.

Weight. Burton shot a cock of 26½ lbs., Fenton gives the average weight as 21 lbs. and Blanford mentions 40 lbs. as the heaviest recorded.

Female. Differs from the male in having the white of the head and neck less pure, more vermiculated with black, whilst the pectoral band is absent or merely indicated on the sides.

Measurements. Wing 460 to 540 mm. Weight 8 to 11 lbs., rarely 14 to 15 lbs. (*Tyrell*) or even 18 lbs. (*Burton*).

Young males differ from the females only in having buff spots on the crown, hind-neck and upper back.

Nestling covered with buff down above, white or whity-buff below; black marks on both the head and back.

Distribution. Punjab, Sind, East to the Jamna and South to Rajputana, Guzerat and the Bombay Deccan. Stragglers have been shot in the United Provinces, Behar, Bengal and Orissa in the East, on the Malabar coast in the South and even in Ceylon, whilst recently a specimen was killed 10 miles North of Trichinopoli (*Leigh*).

Nidification. This fine Bustard seems to be rather erratic in its breeding-haunts, sometimes deserting them for a year for no visible reasons and in other years visiting the same area in exceptional numbers. They breed in the cold season in Southern India but over most of their haunts, after the Rains break, from June to September. Odd eggs may be found in almost any month of the year and the actual breeding-season is a very prolonged one.

Little or no nest is made; the single egg is laid on the ground, sometimes in a slight depression lined with fallen débris, sometimes on the level ground with no nest at all. The favourite site is a grass waste in rather thin straggly grass three or four feet high. At other times it may be laid in a field of millet or other high crop or, again, in some stony stretch or desert with only scanty bushes and stunted grass. The eggs vary greatly in colour but typically they are brown, a rather light reddy-brown, but they may be almost any shade of brown, olive-brown, yellowish-brown, greyish or even olive-green. The markings are sparse and faint, consisting of rather large, ill-defined blotches of reddish-brown, with others underlying of dull lavender. Eighty-eight eggs average 79·4 × 57·6 mm.: maxima **88·7** × 61·0 and 80·5 × **61·3** mm.; minima **68·0** × 55·5 and 82·5 × **53·5** mm.

Habits. In the Winter this Bustard associates in flocks, generally two or three cocks, or two or three hens, consorting together but flocks of 25 and 30 have been recorded, whilst Doig once counted 34 birds in one *Jamba* field. In the Summer the flocks break up and each cock is then seen alone with his own harem, which may number two to six hens. They prefer undulating, or broken, country of waste land, grass or wide open cultivation mixed with, or bordered by, stony arid soil. Their favourite food seems to be either locusts or grasshoppers or the Blister Beetle (*Mylabris*) but they will eat any living thing small enough and also many kinds of crops, grain and shoots of plants etc.; they are also in the habit of constantly swallowing small pebbles and small bright objects of any sort. During the breeding-season they have a "low, deep moaning call" as well as an alarm-note which the natives round Gwalior syllabify as "hookna."

Genus CHLAMYDOTIS.

Chlamydotis Lesson, Rev. Zool., 1839, p. 47 (Feb.-March 1839).

Type by mon., *Otis houbara* Gmelin.

The genus *Chlamydotis* is separable from all other genera of Bustards by the presence of a curious crest of isolated feathers thinly webbed at the base; there is a ruff in both sexes on either side of the neck and the feathers of the lower neck are also lengthened.

The sexes are alike, the female being rather smallar.

There is but one species, *Chlamydotis undulata*, of which the typical form is found in Northern Africa and an Indian race, *C. u. macqueenii*, which breeds in Central Asia.

Chlamydotis undulata.

Psophia undulata **Jacquin, Beitrage Gesch. Vögel, p. 24, pl. 4 (1784).**

Type-locality: Tripoli.

The typical form has the feathers of the fore-neck white instead of grey and the upper plumage more coarsely marked with black.

(2044) Chlamydotis undulata macqueenii.

MACQUEEN'S BUSTARD OR HOUBARA.

Otis macqueenii Grey, Illus. Ind. Zool., Hardwicke, vol. ii, pl. 47 (Oct. 8th, 1832) (Himalayas).
Houbara macqueenii. Blanf. & Oates, iv, p. 196.

Vernacular names. *Tilur* (Punjab); *Talur* (Sindhi); *Hobara* (Punjab).

Description. Forehead, sides of the crown and whole upper plumage sandy-buff, very finely vermiculated with black; on the mantle and scapulars the black develops into definite bars; breast-feathers white on the basal, black on the terminal halves; upper tail-coverts like the mantle but more rufous; tail sandy-rufous vermiculated with black, finely at the base, more coarsely towards the tip; all the tail-feathers, except the central, tipped white with four broad bands of grey, the two apical darker and the central ones almost black; primaries black, with white bases and buff outer webs; inner webs white for two-thirds of their length; outer secondaries the same but with no buff and with white tips; inner secondaries like the scapulars; lesser wing-coverts like the back; median the same but paler; greater coverts with broad black subterminal bars and white tips; sides of the head whitish-buff with black striæ; chin and throat buffy-white; fore-neck pale buff, finely vermiculated with black; on the lower neck and upper breast the buff changes to clear French-grey with few or no vermiculations; lower tail-coverts buffy-white marked with brown; remainder of lower parts white.

Both males and females have ruffs on the sides of the neck; the inner feathers are white on the basal and black on the terminal halves, the outer feathers are white and generally longer and more narrow than the black feathers.

Colours of soft parts. Iris pale to bright golden-yellow; upper mandible blackish, lower mandible and gape greenish or yellowish-horn; legs and feet greenish, plumbeous or brownish-yellow.

Measurements. Wing 363 to 411 mm.; tail 216 to 241 mm.; tarsus about 125 mm.; mid toe 42 to 51 mm.; culmen 34 to 38 mm.

Female only differs in being rather smaller and in having the ruff and neck-plumes less developed.

Measurements. Wing 342 to 381 mm.; culmen 30 to 34 mm.

Young birds differ from the female in having numerous sandy-coloured arrow-head markings on the upper plumage, whilst the crest and ruff are smaller.

Distribution. In the breeding-season from Trans-Jordania to Eastern Persia and South to Afghanistan, Baluchistan and the Persian Gulf. It also breeds in Trans-Caucasia to Turkestan and South-West Altai. In Winter it straggles into most parts of Western Europe, East Egypt and North-West India.

Nidification. The Houbara has not yet been found breeding in India, though Barnes was convinced that they did so in Sind and Cutch. They are desert-breeding birds, laying their eggs, three or four in number, in depressions in the sand or among stones and boulders, generally under shelter of a small bush or a little coarse grass. The country selected is always waste land well away from cultivation, except in the Trans-Jordan, where they were found breeding in stretches of barren land between cultivated fields. In colour the eggs are typical Bustards'; the ground is a brownish stone, sometimes rather bright and sometimes tinged with olive, whilst the markings consist of umber-brown and vandyke-brown blotches and spots with secondary blotches of pale brown and neutral tint scattered fairly freely over the whole surface. In shape they are broad ovals and the texture is strong and close with a glossy surface. One hundred and forty eggs average 62·3 × 45·1 mm.: maxima **68·7** × 43·6 and 62·8 × **48·7** mm.; minima **56·0** × 46·2 and 57·0 × **41·0** mm.

The breeding-season seems to be April and May.

Habits. The Houbara is a bird of the deserts and wide open country, where it congregates in small flocks of three or four to a dozen. They arrive in North-West India in September and leave again in March and April. In suitable parts of the Trans-Indus they are not uncommon and, with a good stalking camel, five or six may be bagged in a day out of three or four times that number seen. Their usual mode of progression is the stately walk of the family but they can run well and often prefer running to flying, their flight being heavy and soon exhausting them. Like all Bustards they are practically omnivorous and are themselves good for the table but, after feeding in the mustard crops are not so delicate. In India they visit both the mustard-fields and oil-seed-fields constantly as well as other cultivation less frequently.

Genus SYPHEOTIDES.

Sypheotides Lesson, Revue Zool., 1839, p. 47.

Type, *Otis aurita* Lath. = *Otis indica* Miller.

In this genus and the next the tarsus is longer in comparison than in any other Indian Bustards, being equal to about one-third the length of the wing; the primaries are very attenuated and are notched on the inner web; of the two species retained by Blanford under the genus, one, *S. indica*, has a seasonal change of plumage but the second, *S. bengalensis*, has none, a difference which supports Sharpe's action in placing the latter in a separate genus, *Houbaropsis*, which is accepted in the present edition.

In the genus *Sypheotides* the male has the feathers of the side of the head and chin long and lanceolate, whilst from each side of the head from below the ear-coverts there is a tuft of feathers with narrow webs and broadened spatulate ends.

The one species in the genus is confined to India.

(2045) Sypheotides indica.

THE LESSER FLORICAN OR LIKH.

Otis indica Miller, Icones Animalia, pt. vi, pl. 33 (1782) (India orientali).
Sypheotes aurita. Blanf. & Oates, iv, p. 198.

Vernacular names. *Likh*, *Chota Charat*, *Barsáti* or *Kala* (Hind.); *Ker mor* (Guzerat); *Chini Mor* (Belgaum); *Khartitar* (Bhil); *Charas*, *Chulla Charas* (Hind., S. India); *Niala Nimili* (Tel.); *Kannoul* (Can.); *Warragu Koli* (Tam.).

Description.—**Male.** Whole head and neck and ear-plumes glossy black; chin and centre of upper throat pure white; between the hind-neck and upper back a broad band of white, running down to the sides of the neck; upper plumage sandy-buff, each feather with a blackish patch edged with yellowish-sandy and vermiculated with brown or blackish; lower back only obsoletely marked; central tail-coverts barred with black; tail sandy-buff, tinged with rufous, finely vermiculated and with four definite cross-bars of blackish-brown; scapulars like the back but freckled with white; greater wing-coverts black, the concealed parts of the inner webs freckled with white and brown; remaining visible coverts white, the bases of the secondary coverts freckled with brown; first two, three or four primaries brown, the remainder with broad bars of rufous-buff, widening towards the secondaries: outer secondaries mottled brown and buff, freckled with white at the tips; inner secondaries like the back, the edges next the coverts freckled with white and the innermost marked with rufous-buff; lower plumage black.

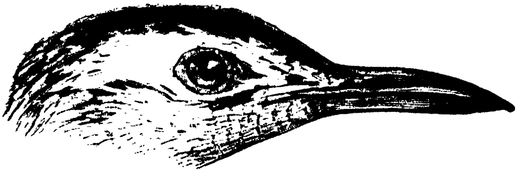

Fig. 13.—Head of *S. indica*, ♀. $\frac{2}{3}$.

Colours of soft parts. Iris pale yellow to yellowish-brown; bill pale yellow, fleshy at the gape and horny-brown on the culmen; legs and feet fleshy or dusky-yellow.

Measurements. Wing 180 to 204 mm.; tail 82 to 114 mm.; tarsus about 85 to 95 mm.; culmen 31 to 38 mm.

Female. Forehead and crown black, the feathers buff-tipped and the inner webs of those on the crown also buff, forming a well-marked mesial streak; lores, supercilium and behind the eye buff with black specks; a line of black specks under the eye; sides of head and ear-coverts buff; hind-neck buff, finely vermiculated with dark brown; upper plumage and wing-quills as in the male; wing-coverts buff, the outer sparsely, the inner profusely barred with brown or black and freckled more or less with the same; chin and throat white; fore-neck buff with broad splashes of black, forming two broad streaks down the sides; breast buff boldly marked with black, remainder of lower parts white or buffy-white, the flanks more or less barred and vermiculated with blackish; axillaries black.

Measurements. Wing 209 to 248 mm.; culmen 37 to 42 mm.

Male in winter. Similar to the female but with much white on the wing.

Nestling uniform dull pale yellowish; a black V on the crown and longitudinal patches of dingy black on the wings, back and sides.

Distribution. This small Bustard is fairly common in suitable country from South-Eastern Punjab, Guzerat and South Sind thoughout Rajputana, Deccan, Western Central India to North Mysore and Madras. Outside these limits it wanders into the North-West Provinces, United Provinces, Western Bengal and Behar. It occurs in Orissa and Bengal as far East as Malda and Nadia; O'Donel obtained it 50° East of the Teesta River. South they occur and breed as far as Trichinopili. It has also been obtained in the Valley of Nepal and has been shot on the Nilgiris.

Nidification. The Likh breeds in Southern India from July to November, occasionally as late as January, whilst over the rest of its habitat September and October are probably the two months in which most eggs are laid, though a good many birds start nesting in October. They breed exclusively, or almost so, in grass-fields and prefer rather thin patches, often small in extent, to wide stretches with long dense grass. The eggs are laid on the bare ground with no pretence at a nest and number three or four, very rarely five and sometimes only two. In colour, texture etc. they cannot be distinguished from those of the Little Bustard but they average smaller and are, generally, rather more spherical in shape. Fifty-four eggs average 49·1 × 40·9 mm.: maxima **52·0** × 42·8 and 49·0 × **44·0** mm.; minima **46·2** × **39·2** mm.

The males are said to be monogamous but it is very doubtful if this is correct.

Habits. The Lesser Florican is not gregarious, though it collects in considerable numbers in some places during the breeding-season; nor is it migratory, though it indulges in local movements which are not yet understood. Some movements are doubtless due to excess or insufficient rainfall, whilst others are merely a question of food-supply but for others there seems no explanation. Their favourite resorts are extensive grass-lands and they also resort to cultivated fields of millet and other crops. This Bustard has a curious habit of leaping into the air above the crops or grass, at the same time uttering a frog-like croak; this is evidently a display to attract the female, which utters a similar note, but very rarely springs into the air, before joining the male. They fly with far more rapid beats of the wing than the Great Bustard or the larger Florican but proceed no faster than these do. Their diet is omnivorous but chiefly seeds and insects, whilst they are themselves excellent birds for the table.

This is one of the Indian Game-birds which requires most rigid protection, as it is constantly shot and harassed during the breeding-season.

Genus **HOUBAROPSIS.**

Houbaropsis Sharpe, Bull. B. O. C., i, p. 1 (June 1893).

Type by orig. desig., *Otis bengalensis* Gmelin.

This genus differs from *Sypheotides* in having no seasonal moult. It contains but one species, which is confined to North-East India and to parts of Cochin China.

(2046) **Houbaropsis bengalensis.**

THE BENGAL FLORICAN.

Otis bengalensis Gmelin, Syst. Nat., i, (2) p. 724 (1789) (Bengal).
Sypheotis bengalensis. Blanf. & Oates, iv, p. 200.

Vernacular names. *Charas*, *Charg*, *Charat* (Hind.); *Dahar*, *Ablak* ♂, *Bor* ♀ (Terai); *Ulú-mora* (Assam).

Description.—Male. Whole head, neck and underparts glossy velvet-black; back black, each feather with two broad bars of buff mottled with black; in quite freshly-moulted birds the feathers have narrow edges of buff, which soon become abraded; inner scapulars like the back but the mottlings more irregular, the centres of the feathers mostly black and the surrounding parts vermiculated buff and black; outer scapulars black, slightly mottled with buff on the inner webs; inner secondaries like the back but with numerous bars of black; outer webs and part of the inner webs of the first and second primaries black, the black decreasing in extent until the innermost primary is all white; remaining quills and wing-coverts white; four central tail-feathers like the back, the outermost entirely black with white tips, the intermediate feathers grading from these to the median.

Colours of soft parts. Iris yellow or brown; bill dark horny- or plumbeous-brown, the lower mandible, gape and upper mandible yellowish; legs and feet straw-yellow, sometimes tinged with green or plumbeous.

Measurements. Wing 338 to 347 mm.; tail 165 to 184 mm.; tarsus 126 to 131 mm.; culmen 30·5 to 32·6 mm.

The feathers of the crest measure three to four inches (100 mm.) or more, whilst the longest feathers of the fore-neck and upper breast run up to six inches, or 160 mm.

Female and male in first plumage. Crown blackish-brown, the feathers speckled and edged with buff on the hinder crown; a broad coronal streak of mottled buff and brown; supercilia and lores buff; crest-feathers buff speckled and centred blackish-buff; back, scapulars and inner secondaries black, the edges mottled and freckled with buff: outer secondaries and scapulars more boldly marked with black; wing-coverts pale buff, tinted rufous and sparsely marked with broken bars of blackish-brown; outer primaries black with faint mottlings of buff on the base of the inner web: this mottling increasing in extent until the whole of the inner secondaries are mottled brown and buff; rump like the back but less broken with buff; tail mottled buff and blackish, the markings bolder and more like bars on the outer tail-feathers; chin and throat buff; remainder of neck sandy-buff, narrowly barred black and brown: down each side of the neck a fairly definite streak of blackish-brown: upper breast and flanks buff, speckled with brownish-black; remainder of lower parts sandy-buff, darker on the under tail-coverts, which are sometimes speckled with dark brown.

Colours of soft parts. Iris yellow; bill and legs are like those of the male but dingier and paler.

Measurements. Wing 338 to 368 mm.; culmen 38 to 39 mm. Although the female is but little larger than the male in wing-measurements etc., she is a much heavier bird, running up to 5 lbs., whilst males are never as much as 4 lbs.

Young males assume the adult, or a semi-adult, plumage at the first Spring moult, but often revert to the juvenile plumage the following Autumn. Once fully acquired this plumage is permanent and not a breeding-plumage only.

Distribution. Assam, Eastern Bengal, Behar and Oude, extending as far West as the Kuman Terai, where it is not rare in suitable country. It is rare in Cachar and Sylhet, though I have shot it in both these districts, whilst it extends to Comilla and Chittagong. Recently Delacour and Jabouille have ascertained that a Florican, either this or a closely-allied form, occurs in some numbers in parts of Indo-China but a series of skins is awaited before deciding what it actually is.

Nidification. The Bengal Florican breeds almost entirely in March and April, though an occasional egg may be laid in February and other, probably second broods, in June or even July. No nest is made, the eggs being laid on the bare ground in the immense grass-lands along the foot of the Himalayas, which extend for hundreds of miles. The female is very shy and leaves her eggs long before danger approaches, so that they are extremely hard to find. She prefers rather thin to very thick patches but I have seen eggs in the densest elephant-grass, over ten feet high. The ground-colour of the eggs is olive-green; in some brighter, in some more brown but fading considerably with time. The markings consist of small and large blotches of purple and purple-brown, never numerous and seldom very conspicuous; in a few eggs there are also secondary blotches of pale purple-grey. The surface is smooth and glossy and the shape a very regular oval. One hundred eggs average 64·3 × 45·8 mm.: maxima **70·6** × 46·1 and 67·0 × **48·0** mm.; minima **57·9** × **42·5** mm.

Habits. The Florican keeps almost entirely to the vast areas of grass-lands found along the Himalayan Terai and the banks and sand-banks of the great rivers, the Brahmapootra and others. Occasionally they enter cultivation and I have shot them more than once out of rice-fields but they are seldom found in wet land. During the season they display by leaping in the air above the grass just as the Likh does. The birds do not pair and apparently are quite promiscuous in the attentions they pay and receive. They utter a curious drumming sound in the breeding-season as well as a little chirrup or croak when leaping, whilst the alarm-note is a metallic "chik-chik." They are good sporting birds; fly well and much quicker than the slow beats of their wings lead one to suspect, whilst they are not difficult to flush. They run well and walk erect and gracefully but, when startled, seek safety on wings rather than on foot. Their soft plumage offers little resistance to shot and No. 7 or 8 shot brings them down at considerable distances. They are among the best of table-birds on the Indian list and are themselves omnivorous, eating grain, seeds, shoots and all kinds of insects, frogs, worms etc.

Order IX. CHARADRIIFORMES.

In 1922, in an admirable paper [*], which appeared in 'The Ibis,' Dr. P. Lowe discussed certain characters of the above Order and I adopt in the present work the conclusions arrived at in this paper, with the exception of the position of the *Jacanidæ*, which Dr. Lowe himself modified in a subsequent paper [†]. In this volume it would be impossible to quote his reasonings at any length and all that has been attempted is to briefly summarize the characters he relies on for his various divisions.

In the first place Dr. Lowe includes in the one Order, *Charadriiformes*, Blanford's two Orders, *Limicolæ* and *Gaviæ* and then divides these into three Suborders, *Oti-Limicolæ*, *Limicolæ* and *Laro-Limicolæ*, these again being divided into Families and Subfamilies which will be dealt with as each is arrived at.

In the *Charadriiformes* the wings are long, there are eleven primaries, though the terminal one is very short in the *Laro-Limicolæ*; the fifth secondary is wanting; tail-feathers varying greatly in number, except in the *Laro-Limicolæ*, in which they are always twelve; the oil-gland is always present and tufted; spinal feather-tract well defined on the neck by lateral bare tracts, forked on the upper back; the dorsal apterium well developed; an after-shaft to the feathers always present. The skull is schizognathous; sometimes schizorhinal, sometimes holorhinal; basipterygoid processes sometimes present, sometimes absent in the *Oti-Limicolæ*; always present in the *Limicolæ* but always absent in the adult *Laro-Limicolæ*; the furcula is U-shaped; there are always two carotids; cæca present; but small in the *Laro-Limicolæ* and functionless in the *Laridæ*.

Key to Suborders.

A. No basipterygoid processes in the adult.
  a. Ectethmoid absent .... **Oti-Limicolæ,** p. 76.
  b. Ectethmoid present .... **Laro-Limicolæ,** p. 83.
B. Basipterygoid processes present in the adult.......................... .... **Limicolæ,** p. 152.

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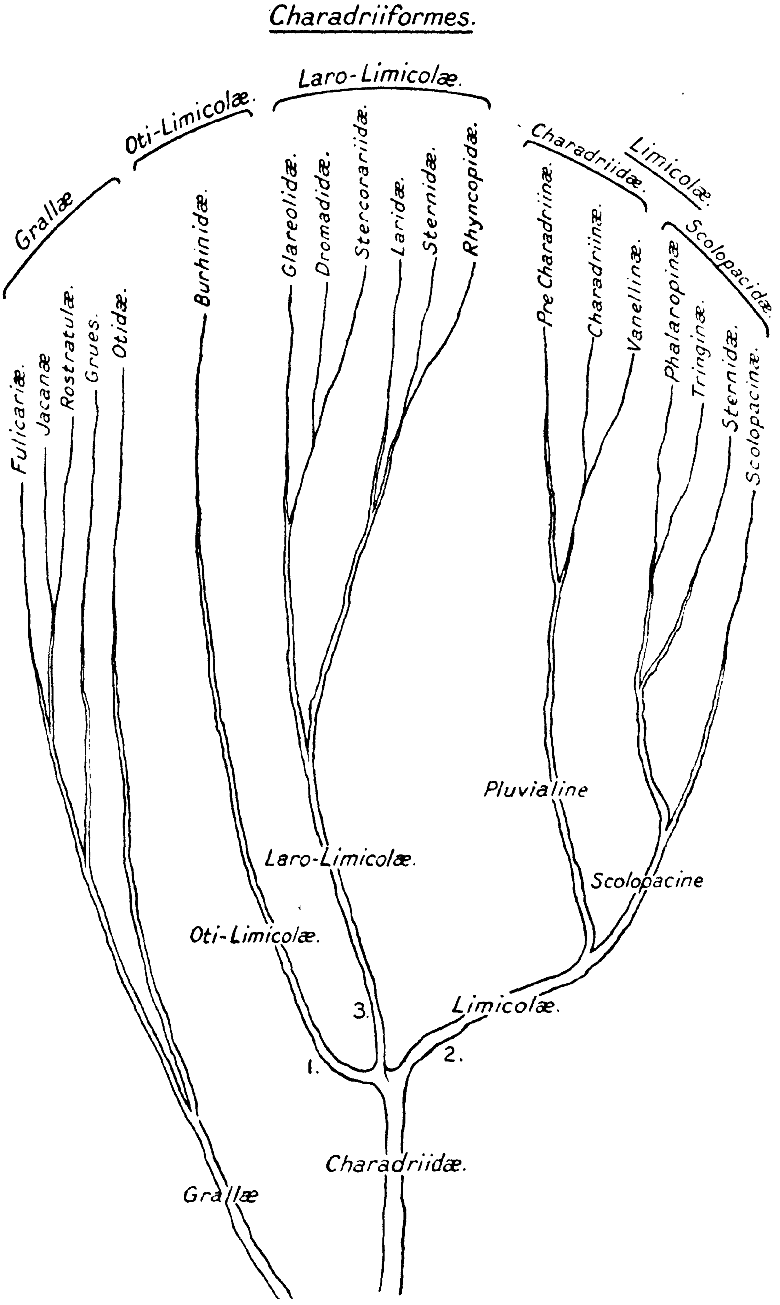
[*] "On Certain Characters in Charadriine Genera," P. Lowo, Ibis, 1922, pp. 475–498.

[†] "The Systematic Position of the Jacanidæ," Lowe, Ibis, 1925, pp. 132–147.



Hypothetical phylogenetic tree of the **Charadriidæ** adapted for the Indian Avifauna from the illustration to Dr. P. R. Lowe's paper in the 'The Ibis,' 1922, p. 492: "Certain Characters in Charadriine Genera."

Suborder OTI-LIMICOLÆ.

The *Oti-Limicolæ* are divided from the *Laro-Limicolæ* in having the ectethmoid absent and from the *Limicolæ* in having no basipterygoid processes. As at present restricted it contains but one family, the *Œdicnemidæ*, or Stone-Plovers, which are represented over practically the whole of the Old World.

Family ŒDICNEMIDÆ.

Holorhinal; nostrils pervious; no basipterygoid processes; cervical vertebræ 16; no hind-toe, the three anterior toes united by a web at the base; tarsus long, reticulated all round; eyes very large.

The Stone-Plovers form a very natural link with the Bustards and this group is now disassociated with those also included in Blanford's *Limicolæ* and retained as a single family in the *Oti-Limicolæ*. The *Glareolidæ* have been removed to the *Laro-Limicolæ* together with that extraordinary bird, the Crab-Plover, *Dromas*, whilst the *Jacanidæ* have been shown to be nearer the Rails than to the Plovers and have been raised to the dignity of a Suborder. Finally, the *Charadriidæ* have been separated as a Suborder, the *Limicolæ*.

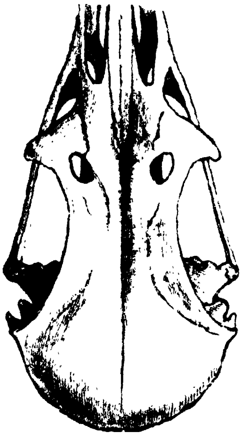


Fig. 14.—Skull of *Burhinus œdicnemus* (holorhinal).

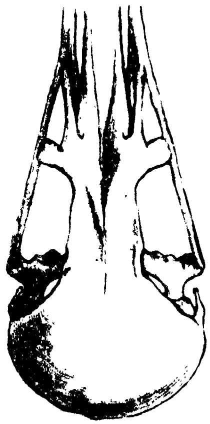


Fig. 15.— Skull of *Numenius arquata* (schizorhinal).

Figs. 14 and 15 on p. 76 show the difference in holorhinal and schizorhinal skulls. In the former the external hinder border of the osseous nares is simple and usually rounded, in the latter the orifice is prolonged posteriorly, terminating in a narrow fissure between the processes of the nasal bone.

Key to Genera.

A. Bill not longer than head and not compressed	BURHINUS, p. 77.
B. Bill much longer than head and compressed	
a. Culmen curving upwards	ESACUS, p. 80.
b. Culmen straight or almost so	ORTHORAMPHUS, p. 81.

Genus **BURHINUS.**

Burhinus Illiger, Podr. Mam. et Aves, p. 250 (1811).

Type by mon., *Charadrius magnirostris* Lath.

Bill shorter than the head, stout, straight and broader at the base than high; nostrils elongate and placed in a shallow groove; eyes very large and forehead high; wing long and pointed, the second primary longest; tail of twelve slightly graduated feathers; three toes only, the nail of the middle toe broad and dilated on the inner side.

Burhinus œdicnemus.

Charadrius œdicnemus Linn., Syst. Nat., 10th ed., p. 151 (1758) (England).

The typical form is larger and more buff than *B. œ. indicus* and darker than *B. œ. astutus.*

Key to Subspecies.

A. Smaller, wing 203 to 222 mm.; darker and more buff	*B. œ. indicus,* p. 77.
B. Larger, wing 228 to 244 mm.; paler and less buff	*B. œ. astutus,* p. 79.

(2047) Burhinus œdicnemus indicus.

THE INDIAN STONE-PLOVER.

Œdicnemus indicus Salvadori, Atti Soc. Ital. Sci. Nat. viii, p. 381 (1866) (India).
Œdicnemus scolopax. Blanf. & Oates, iv, p. 204 (part.).

Vernacular names. *Karwanak, Barsiri* (Hin.); *Lambi* of Falconers; *Kharma* (Beng.); *Kaledu* (Tel.); *Kana mosul* (Tam.).

Description. Forehead, lores, a ring round the eye and a broad supercilium to the nape white; upper plumage ashy-brown, the feathers edged with buff or ashy-buff and with black central streaks; these are broad on the head, narrower on the nape and much broader again on the scapulars; lesser wing-coverts brown edged rufous and with black subterminal bars; median wing-coverts white with brown or blackish terminal bars just edged with rufous or rufescent white, the basal white forming a distinct diagonal wing-bar; greater coverts dull white, with broad subterminal black bars; primaries black with a broad white patch on the middle of the two outermost, the other primaries with concealed white bases and the innermost with white tips also; innermost secondaries like the back; tail ashy-brown, tipped paler and with two irregular dark bars on the pale tips; outermost feathers white, with broad black tips and a faint dark band across the white of inner webs, other feathers grading from this to the central ones; sides of head white; the ear-coverts streaked with black; a black and rufous streaked line from the gape to the ear-coverts; chin and throat white; fore-neck and upper breast pale buff, streaked with blackish-brown; under tail-coverts pale buff; remainder of lower plumage white.

Colours of soft parts. Iris bright yellow; bill black with a yellow base; legs and feet yellow or greenish-yellow.

Measurements*. Total length about 400 mm.; wing 203 to 222 mm.; tarsus 72 to 77 mm.; culmen 41 to 47 mm.

Young birds are paler, more marked with buff and have the streaks on the lower part narrower; the white wing-bar is not so distinct.

Nestling. Sandy-grey, the crown marked with black lines; two broad lines on each side of the centre of the back and two lateral bars to the tail tuft; underparts buffy-white, darker buff on the breast.

Distribution. India, Burma, Ceylon, S.W. and Central Siam.

Nidification. The Indian Stone-Plover breeds principally in April to June and casually from January to August but the great majority of eggs are laid in April. For breeding purposes the birds frequent both open desert, ploughed land and other cultivation, grass-field or scrub-jungle, whilst their favourite resort is a large mango-orchard with a fairly thick undergrowth of rank grass. No nest is made and, as a rule, no depression, the eggs being deposited on the bare ground. When there is no grass they are generally laid under shelter of a bush or hedge but I have seen them quite in the open, unconcealed or protected by any cover. Hume and Blewitt both took clutches of three eggs but I have never seen more than two. They are handsome eggs, the ground varying from almost white to a deep buff with large, bold blotches and patches of brown and blackish-brown with a few secondary and smaller markings of grey. In shape they are broad, blunt ovals whilst sixty eggs average 47·6×34·7 : maxima **52·0**×34·2 and 48·1×**36·2** mm.; minima **44·0**×34·0 and 50·3×**32·0** mm.

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* The measurements are taken from Mrs. A. Meinertzhagen's review of the genus *Burhinus* (Ibis, 1924, p. 339).

Habits. The Indian Stone-Plover frequents wide open spaces in dry country and is found alike in deserts, sandy beds of rivers, arid undulatory country and dry cultivated fields. Except that it often resorts to orchards to breed, it avoids trees and is never found in forests. It follows the course of the larger rivers up to some elevation and Primrose found it breeding on the banks of the Teesta at 3,000 feet. It feeds entirely on insects, worms, snails, frogs etc. and it swallows large numbers of tiny flints and similar stones. Its flesh is said to be excellent. The piping call is rather like the wailing note of the Curlew, being uttered principally in the mornings and evenings. It is very sluggish during the great heat of mid-day and is rather crepuscular in its habits.

(2048) Burhinus œdicnemus astutus.

THE PERSIAN STONE-CURLEW.

Burhinus œdicnemus astutus Hartert, Nov. Zool., 1916, p. 93 (Fao, Persia).

Œdicnemus scolopax. Blanf. & Oates, iv, p. 294.

Vernacular names. *Karwanak*, *Barsiri* (Hind.).

Description Similar to the preceding bird but much paler and generally with finer dark striations.

Colours of soft parts as in the other races.

Measurements. Wing 228 to 244 mm.; culmen 38 to 45 mm.

Distribution. Merv in Turkestan, Mesopotamia, Persia to Fao and the Persian Gulf, Mekran and Baluchistan, Sind to the Sirsa Desert. Stragglers occur in Winter as far as Lahore and I have seen a specimen, apparently of this race, from Oude.

Nidification. Similar to that of the preceding bird but this race seems to keep more exclusively to desert country and stony low hills. Fifteen eggs average 48·7×36·5 mm.: maxima **51·2**×37·4 and 49·0×**38·0** mm.; minima **46·6**×36·5 and 48·0×**35·0** mm. The breeding months are April, May and June.

Habits. Those of the species.

Genus ESACUS.

Esacus Lesson, Traité d'Orn., p. 547 (1831).

Type by mon., *O. recurvirostris* Cuvier.

The genus *Esacus* is distinguished from *Burhinus* by its much more massive bill, which is compressed and nearly twice the length of the middle toe without claw.

Blanford retained two species in this genus, including *Orthoramphus magnirostris* in it but, as *Orthoramphus* differs from *Esacus* quite as much as *Burhinus* does from that genus, it seems only consistent to have three genera, the alternative being to lump all the species in one genus, *Burhinus.*

(2049) Esacus recurvirostris.

THE GREAT STONE-PLOVER.

Œdicnemus recurvirostris Cuvier, Règne An., i, p. 500 (1829) (no type-locality) (Nepal).
Esacus recurvirostris. Blanf. & Oates, iv, p. 205.

Vernacular names. *Barra karwanak* (Hind.); *Abi* of Falconers; *Gang Titai* (Beng.); *Mien-zein* (Burm.).

Description. Lores, feathers round the eye and short supercilium white; above the latter a blackish streak and below the eye another through the ear-coverts down the side of the neck; remainder of upper parts pale ashy grey-brown; the crown and nape with very fine shaft-streaks of brown and the shafts elsewhere a little darker than the webs; lateral tail-feathers with broad black tips, white sub-tips, followed by a narrow dark brown line; wing-coverts paler than the back; the innermost lesser coverts and the greater and primary coverts blackish; primaries blackish-brown with a broad white central splash on the first two, smaller on the third and basal on the fourth and fifth; inner primaries white with broad subterminal bands of blackish-brown; outer secondaries brownish-black with white bases and tips paling to the colour of the back on the longest and innermost; a short grey-brown moustachial streak; remainder of lower plumage white.

Colours of soft parts. Iris yellow or greenish-yellow; bill black, greenish-yellow or yellow round the base of both mandibles and the posterior nostril; legs and feet yellowish-green, dull pale olive-greenish or pale bluish-green.

Measurements. Total length about 550 mm.; wing 252 to 273 mm.; tarsus about 80 to 84 mm.; culmen 74 to 87 mm.

Distribution. India, Burma, Ceylon; Hainan.

Nidification. The Great Stone-Plover breeds from February to the end of March, a few birds laying throughout April and early May. These last eggs often get flooded out forcing the birds to leave the river-beds, their favourite nesting haunt, and then eggs may rarely be found on fields near rivers. The eggs are laid on the ground in a slight depression and the birds prefer shingle, or mixed sand and rock to pure sand, though, in Assam and Eastern Bengal, sand-banks are often selected. The eggs are two in number and are large editions of those of the Indian Stone-Plover though scrolled, rather than blotched eggs, are more common with this species. Forty-four eggs average 54·4 × 40·7 mm.: maxima 57·1 × 43·6 and 55·1 × 43·8 mm.; minima 50·1 × 39·0 and 53·2 × 38·1 mm.

Habits. This bird frequents the beds of rivers or the sandy coasts of the Bay of Bengal and round Ceylon. When the rivers are in high flood they take to the adjacent fields or waste land but never seem to enter jungle or grass of any kind. Like all the family they are very crepuscular, feeding in the mornings and evenings on crabs, molluscs, insects and worms but principally on the first-named. Their call is a loud harsh croak and they make a hissing sound when disturbed. They are quite good birds to eat, tasting like Golden Plover.

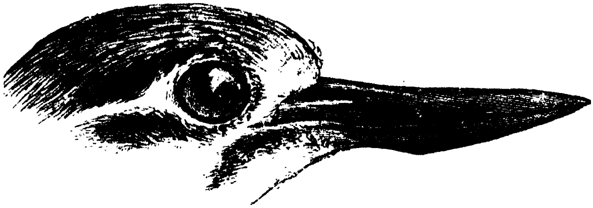

Fig. 16.—Head of *E. recurvirostris.* ½.

Genus ORTHORAMPHUS.

Orthoramphus Salvadori, Ann. Mus. Civ. Genoa, v, p. 312 (1874).

Type by mon., *Œdicnemus magnirostris* Vieill.

This genus differs from *Esacus* in having the culmen curved and convex instead of almost straight.

(2050) Orthoramphus magnirostris magnirostris.

THE AUSTRALIAN STONE-PLOVER.

Œdicnemus magnirostris Vieill., Nouv. Dict. d'Hist. Nat., xxiii, p. 231 (1818) (Timor).
Esacus magnirostris. Blanf. & Oates, iv, p. 351.

Vernacular names. None recorded.

Description. Whole upper parts light brown, the feathers of the head with dark brown centres occupying most of the feather and making it look very dark; remaining upper parts dark-shafted and with pale tips; tail like that of *E. recurvirostris* but central rectrices with broken pale and dark terminal bars; lesser wing-coverts tipped white, making a wing-bar; remaining wing-coverts pale grey, the greater with broad white tips, forming a central white bar; outer primaries brown banded with white, this increasing until the inner primaries are pure white; secondaries like the back; feathers round the eye and behind the ear-coverts white, all round the white and the lores blackish; a broad black streak from the lower mandible; chin and throat white; lower neck and breast pale grey, with darker shafts, those on the neck broadening to dark streaks; under tail-coverts buff; remainder of lower plumage white.

Colours of soft parts. Iris and orbital skin chrome-yellow; bill black, yellowish at the extreme base; legs and feet yellow, greenish-yellow or greyish-yellow; claws blackish.

Measurements *. Total length 620 mm.; wing of Andaman birds 266 to 277 mm.; tarsus 80 to 84 mm.; culmen 76 to 82 mm.

Distribution. Andaman Islands, the coasts of the Federated Malay States and islands of the Malay States to Australia. This species has been split up into many subspecies by Mathews, whilst Oberholser has named the bird from the Tambelan Islands *scommophorus*. This is rather paler than the typical form and agrees in this respect with the Andaman birds, which may have to bear this name if further material confirms the diagnosis. Mrs. Meinertzhagen, in her article in the 'Ibis' referred to, lumps *Burhinus*, *Esacus* and *Orthoramphus* under the one genus, *Burhinus*. This has necessitated her giving a new name to our bird, which becomes *B. n. neglectus* of Mathews for those who follow her generic classification.

Nidification. This fine Stone-Plover breeds on the Andamans, eggs having been taken on the 24th of March by Hume and in April by M. Bonig. In the various islands farther East it seems to breed from August 30th to November 5th. The eggs are laid in shingle beds on the coast above high-water mark. The eggs, which are very handsome, go through an even greater range of coloration than our Indian Stone-Plover. Fifteen average 63·7 × 45·0 mm.: maxima **68·5** × 44·3 and 64·2 × **47·1** mm.; minima **60·2** × **42·8** mm. An abnormally small egg, measures only 54·3 × 41·0 mm.

Habits. Apparently very similar to those of *Burhinus œ. indicus*, except that it haunts the sea-shore instead of rivers. It lives, in the Andamans at all events, almost entirely on small crustacea and molluscs.

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* For measurements of extra-limital birds see 'Ibis,' 1924, pp. 352–353.

Suborder LARO-LIMICOLÆ.

This group of birds is distinguishable at once from the preceding by having the ectethmoid present.

It contains, in India, six families which at first sight appear to belong to very different classes of birds. The *Dromadidæ*, a family containing the one genus and one species, *Dromas ardeola*, is superficially very unlike the Gulls and Terns and certainly broke off from the Laro-Limicoline group at an early stage of its existence. Anatomically, however, it is closely related to the Gulls and even more closely to the Skuas, *Stercorariidæ*, and also to another aberrant group, the *Glareolidæ*. In appearance the Crab-Plover bears in many ways a superficial resemblance to *Burhinus*, whilst the *Glareolidæ* contain two subfamilies, one, the *Cusoriinæ*, birds with long legs and Plover-like carriage and secondly, the *Glareolinæ*, birds with short legs but Plover-like flight. All we can say at present is that such anatomical evidence as is available shows that the families contained in the present group are nearer to one another than to any other. It may well prove, however, when more evidence is forthcoming, that both the *Glareolidæ* and *Dromadidæ* deserve separation from the *Laro Limicolæ*, and should be placed in suborders by themselves, branching off at a still earlier period from the Charadriine stem.

Key to Families.

A. Three anterior toes only partially webbed.	
a. Toes united at the base only with membrane. Nostrils pervious	**Glareolidæ**, p. 84.
b. Toes with deep web between third and fourth, small web only between second and third. Nostrils impervious	**Dromadidæ**, p. 94.
B. Three anterior toes fully webbed.	
c. Bill with cere; cæca well developed	**Stercorariidæ**, p. 96.
d. Bill with no cere; cæca small and functionless.	
a'. Bill not compressed.	
a^2. Upper mandible larger than lower..	**Laridæ**, p. 100.
b^2. Upper and lower mandibles about equal	**Sternidæ**, p. 110.
b'. Bill very strongly compressed	**Rhyncopidæ**, p. 150.

Family GLAREOLIDÆ.

Skull schizorhinal (except in *Pluvianus*); nostrils impervious, oval, more or less protected by a membrane and situated in a basal depression and not in a groove; no basipterygoid processes; cervical vertebræ fifteen; middle toe pectinated; tarsus transversely shielded in front and behind.

This family is divisible into two groups, the Coursers with long tarsi and Plover-like carriage and actions, and the Pratincoles or Sand-Swallows with short tarsi and rather Tern-like action and flight.

Key to Subfamilies.

A. No hind toe; tarsus equal to one-third of wing or more	*Cursoriinæ*, p. 84.
B. A small hind toe; tarsus equal to about one-fifth of wing	*Glareolinæ*, p. 89.

Subfamily CURSORIINÆ.

Key to Genera.

A. Bill rather long, narrow and slightly curved; no pectoral bands..................	CURSORIUS, p. 84.
B. Bill straight; breast with two transverse bands	RHINOPTILUS, p. 87.

Genus **CURSORIUS.**

Cursorius Lath., Ind. Orn., i, p. 751 (1790).

Type by taut., *Charadrius cursor* Lath.

The bill in this genus is rather long, slender and slightly arched; the tarsus and bare tibia are slender and shielded in front and behind; there is no hind-toe and the anterior toes are short, the middle one decidedly longer than the others, with its claw expanded internally or slightly pectinated; the wings are long and pointed, the first and second primaries equal and longest, the tail is short and nearly even.

Key to Species.

A. Crown rufous in front, grey behind	*C. cursor*, p. 85.
B. Crown chestnut throughout	*C. coromandelicus*, p. 86.

(2051) Cursorius cursor cursor.

The Cream-coloured Courser.

Charadrius cursor Latham, Gen. Synop. Birds, Suppl. i, p. 293 (1787; (England).
Cursorius gallicus. Blanf. & Oates, iv, p. 211.

Vernacular names. None recorded.

Description. Forehead and fore-crown rufous, the lores paler; hind-crown and nape ashy-grey; a nuchal patch black; supercilia white, meeting round the black patch; a second line of black from the eye below the supercilium; upper plumage, wing-coverts and inner secondaries rufous-sandy; primaries and primary coverts black; outer secondaries rufous-sandy, tipped white and with a subterminal patch; tail-feathers sandy-rufous, the central with an obsolete black spot, the lateral with broad black subterminal spots and white tips, the white extending to the outer web of the outermost feathers; wing-lining and axillaries black; lower plumage paler sandy-rufous, the chin and throat paler and the under tail-coverts absent or quite white.

Colours of soft parts. Iris brown; bill black; legs yellowish or fleshy-white.

Measurements. Wing 150 to 171 mm.; tail 58 to 72 mm.; tarsus 55 to 60 mm.; culmen 21 to 26 mm.; generally 23 to 25 mm. Sexes alike.

Young birds are a paler duller sandy and are barred on the upper plumage with blackish-brown; there is no grey or brown on the crown.

Distribution. North Africa, Marocco to Egypt; South-West Asia from Palestine to North-West India, South Persia, Afghanistan and Baluchistan. In India it occurs as far as South-East as Ajmere, Jodhpur and Erinpura and South to Cutch. In Europe it occurs regularly as far as Italy and South France and sporadically to England.

Nidification. The Cream-coloured Courser breeds in Northern Africa and from Palestine to Mesopotamia, during March to June. Pitman took a fine series of their eggs in the Sinai desert between the end of March and early May, whilst in Palestine Sladen took them up to the end of June. The two eggs are laid in the sand without any protection and the birds sit very close, returning to their eggs when disturbed before the intruder has gone many yards. They have a ground-colour of pale sandy-grey or buff and are freckled all over with darker sandy-brown or brown. In most specimens the secondary marks of pale grey are equally numerous and similarly scattered all over. In a few eggs the markings are most numerous in a ring at the larger end. The only twenty eggs I have seen of this race average 34·7 × 27·2 mm.: **maxima 39·3 × 29·0** mm.; **minima 32·2** × 26·5 **and 34·0 × 25·5** mm.

Habits. This Courser is an inhabitant of desert country, where its colour harmonizes completely with its surroundings until it catches the eye whilst rapidly running from one point to another. Its actions are very much like those of *Burhinus*, consisting of constant rapid little runs hither and thither with head and tail depressed, after which for a few seconds it will stand erect like a Bustard. It flies strongly and rapidly but if suddenly frightened will sometimes seek safety by squatting close to the sand with head stuck out in front. In this position it merges so beautifully into the sand around it that it is very hard to detect. It feeds almost entirely on insects.

(2052) Cursorius coromandelicus.

THE INDIAN COURSER.

Charadrius coromandelicus Gmelin, Syst. Nat., i, p. 692 (1788) (Coramandel coast).
Cursorius coromandelicus. Blanf. & Oates, iv, p. 210.

Vernacular names. *Nukri* (Hind.); *Yerra Chitawa, Durawayi* (Tel.).

Description. Crown rich rufous with a small black nuchal spot; a broad white supercilium meeting behind this black spot; lores and a black band through the eye, down the neck and surrounding the white; hind-neck rufous; upper tail-coverts white; remainder of upper plumage light brown, slightly sandy; primaries black; outer secondaries black with white tips and brown towards their ends; inner secondaries, lesser and median coverts like the back; greater coverts black; lateral tail-feathers with broad white tips and black sub-tips; breast and flanks chestnut, deepening on the abdomen and succeeded by a black patch; lower abdomen and posterior flanks grey, changing to white on the vent and lower tail-coverts; chin and throat white; fore-neck pale rufous; under wing-coverts black.

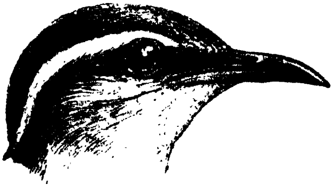

Fig. 17.—Head of *C. coromandelicus.* ⅓.

Colours of soft parts. Iris dark brown or hazel; bill black; egs and feet ivory-white or creamy-white.

Measurements. Wing, ♂ 136 to 147 mm., ♀ 141 to 156 mm.; tail 50 to 57 mm. tarsus 50 to 58 mm.; culmen 19 to 21 mm.

Young birds are dull buff above, irregularly barred with blackish brown; there is a small pale supercilium but no black on the crown; the breast is dull rufous, more or less barred with blackish; chin and abdomen white.

Distribution. The drier, more open and desert portions of India from North Ceylon to North-West India and Western Bengal. It is common in the deforested parts of Travancore but is rare on the Malabar coast and, again, is absent from the pure desert country of Cutch, Sind and the North-West Province.

Nidification. The Indian Courser breeds in Central India from April to June, in Western India from March to July and in Travancore principally in May and June. No nest is made, the eggs being laid on the bare ground either among pebbles and rubbish on the coast, as in Malabar, or on ploughed fields, fallow fields or waste lands. Occasionally they may be found on rocky hill-sides in thin scrub but never on sandy deserts. The eggs are almost invariably two only in number and in colour exactly match the black soil and yellow débris on which they are laid. The ground-colour varies from a pale stone to a rich yellow-buff, whilst the markings consist of blotches and smears or endless lines and scriggles of black covering most of the ground-colour. In a few eggs the marks are more brown than black. Forty eggs average 30·7 × 24·0 mm.: maxima **34·1** × 23·9 and 31·5 × **26·1** mm.; minima **28·2** × 23·1 and 30·2 × **22·1** mm.

Habits. This Courser does not affect the driest areas with hardly any rainfall but, on the other hand, is seldom found in areas of heavy rainfall. It keeps to open country, cultivated and waste, or to such as is covered by thin scrub and tufty, scattered grass. It is a shy, wary bird except when incubating and runs away at great speed when disturbed. Its food is almost entirely insectivorous and its own flesh is said to be good to eat, though dry. As a rule it is found singly or in pairs but sometimes consorts in small flocks.

Genus **RHINOPTILUS.**

Rhinoptilus Strickland, P. Z. S., 1850, p. 220, Jan. 1852.

Type, *Cursorius bicinctus* Temm.

The genus differs from the last in its smaller bill, which is straight and rather broader at the base; the breast has two bands across it and the wing is rather rounder, with the second and third primaries longest and subequal.

The genus is strongly represented in Africa but in Asia there is but one species, a very rare form restricted to Southern India.

(2053) Rhinoptilus bitorquatus.

JERDON'S COURSER.

Rhinoptilus bitorquatus Blyth, J. A. S. B., xvii, pt. 1, p. 254 (1848) ex Jerdon MS. (Eastern Ghats); Blanford & Oates, iv, p. 212.

Vernacular names. *Adava-wuta-titti* (Tel.).

Description. Forehead, supercilia and a broken central coronal streak pale buff or white; remainder of crown and hind-neck dark brown, surrounded by the pale buff; tail-coverts white; remainder of upper plumage, scapulars and inner secondaries brown; tail-feathers blackish, the outermost broadly white at the base and all the lateral feathers with white apical spots on the outer webs; median coverts paler grey-brown with broad white edges forming a conspicuous wing-bar; greater and primary coverts black; primaries black, the outermost with a broad white patch on the outer web, joining obliquely with a similar broad white subterminal patch on the inner web, the white decreasing to a small spot on the inner web of the fourth; outer secondaries black, broadly edged with white on the inner webs; chin and throat white; fore-neck rufous surrounded by a black-edged white band; breast brown with a broad white belt across the lower part; under wing-coverts black and white; axillaries, lower breast, flanks and abdomen creamy-white changing to white on the under tail-coverts.

The feathers of the upper parts are obsoletely edged paler and the wing-coverts more definitely so, a character possibly of the juvenile plumage.

Colours of soft parts. Iris dark brown; bill blackish-horny at the tips of both mandibles, pale yellow from the nostrils to the gape, legs pale yellowish-white with a fleshy tinge, soles flesh-coloured, nails horny.

Measurements. Wing 161 to 168 mm.; tail 64 to 65 mm.; tarsus 68 mm.; culmen 18 to 19 mm.

Distribution. The forest country from the Godavery Valley to the neighbourhood of Madras. Jerdon discovered it in Nellore and Cuddapah and Blanford obtained it close to Sironcha on the Godavery and again near Bhadrachalam, whilst, in 1900, Howard Campbell saw it near Anantpur, much farther West.

Nidification. An account in the 'Asian' describes the eggs as being laid on the ground, two in number, the ground-colour bright yellow-stone, almost obliterated by black scrawly blotches and spots. The birds were said to be breeding in thin scrub-jungle and to be very shy and wary.

Habits. Jerdon and Blanford both found this Courser in thin forest or scrub, whilst Campbell says he saw it twice, in pairs, running about in dry bush-jungle. On both occasions it ran away with great rapidity and did not take to wing. Blanford says that it flies better than *Cursorius*, whilst Jerdon says it has a plaintive cry. Blanford's birds obtained in March and May were not breeding but Howard's male, the only one he managed to get, had very enlarged testes. This was in June, so presumably the birds breed about then.

Subfamily GLAREOLINÆ.

In this genus the bill is short, wide and rather high at the base, the culmen curved and the gape very large; the wings are long and narrow, the closed wing reaching to the tip of, or beyond, the tail; the first primary is longest; the tarsus is short, scutellate in front and behind; the hind toe is well developed and raised above the anterior toes at the base; lateral toes short, the outer and middle toe united by a small web; claws long, that of the middle toe pectinated on the inner margin.

Genus **GLAREOLA.**

Glareola, Brisson, Orn., i, p. 48 (1760).

Type by taut., *Hirundo pratincola* Linn.

Characters those of the subfamily.

Key to Species.

A. Tail deeply forked; wing exceeding 170 mm.	
a. Outer tail-feathers exceeding central tail-feathers by about 50 mm.	*G. pratincola*, p. 89.
b. Outer tail-feathers exceeding central tail-feathers by 25 mm. or less.	*G. maldivarum*, p. 90.
B. Tail nearly even; wing under 170 mm. . .	*G. lactea*, p. 92.

(2054) **Glareola pratincola pratincola.**

THE COLLARED PRATINCOLE.

Hirundo pratincola Linn., Syst. Nat., 12th ed., p. 345 (1766) (Austria).
Glareola pratincola. Blanf. & Oates, iv, p. 216.

Vernacular names. None recorded.

Description. Upper plumage brown, faintly tinged with olive, the back and sides of the neck more pale rufous; lores and a line under the eye running down the sides of the neck and in a narrow gorget across the upper breast black, indistinctly edged with white; rump and shorter tail-coverts white; longer tail-coverts brown with paler edges; tail black with broad white bases; chin and throat inside the gorget pale rufous; breast pal isabelline-rufous, changing to rufous on the lower breast and pure white on the abdomen and under tail-coverts; lesser and median under wing-coverts and axillaries deep rufous.

Colours of soft parts. Iris dark brown; bill black, the gape reddish; legs and feet dusky black.

Measurements. Wing 176 to 200 mm.; tail, longest outermost feather 102 to 119 mm., shortest central feathers 54 to 58 mm.; tarsus 30 to 32 mm.; culmen 15 to 16 mm.

Young birds are olive-brown above, the feathers pale tipped and with black sub-edges, there is no black neck-line or gorget and the breast is mottled brown and rufous-white.

Distribution. South Europe, Central and Western Asia to Sind and Cutch. In Winter it wanders into Africa. In India it breeds in Sind and straggles as far as Allahabad, the Deccan and Ratnagiri.

Nidification. In Europe this Pratincole breeds during April and May but in Palestine and Mesopotamia most eggs have been taken in June, whilst in Sind and Cutch it breeds in company with the following species during April and early May. It makes no nest but lays its eggs on the ground, either on the level ground or in some depression, on mud-flats, edges of swamps or on waste stony ground. The eggs number two or three and are very like those of the preceding bird but less richly coloured, the ground very seldom strongly yellow or buff; the markings, also, are generally less numerous and only exceptionally of the scrolled variety. Forty Indian eggs average 30·5 × 23·4 mm.: maxima **31·6** × 23·1 and 30·7 × **24 2** mm.; minima **29·2** × 24·0 and 30·0 × **22·4** mm. The birds sometimes breed in colonies, though these are often very scattered.

Habits. These little Coursers associate in small flocks during the Winter and have all the characteristic habits of the family. They keep to open ground of almost any kind, preferably not sand but dark soil of some sort, running at great speed in short dashes hither and thither, as they feed on the various insects and small grasshoppers. They fly very strongly and at great speed, constantly whirling and wheeling about as they go. These birds are never found in forest or in heavy bush country but sometimes frequent thin scrub and light short grass-land or cultivated fields.

(2055) Glareola maldivarum maldivarum.

THE LARGE INDIAN PRATINCOLE OR SWALLOW-PLOVER.

Glareola maldivarum Forster, Fauna Indica, p. 11 (1795) Maldive Is.).

Glareola orientalis. Blanf. & Oates, iv, p. 214.

Vernacular names. None recorded.

Description. Differs from the preceding bird in being much darker both above and below and in having comparatively less white on the tail. The tail itself is much shorter and much less deeply forked.

Colours of soft parts as in *G. pratincola.*

Measurements. Wing 173 to 191 mm.; tail, longest outermost feathers 71 to 85 mm., shortest central feathers 52 to 62 mm.; tarsus 30 to 33 mm.; culmen 13 to 15 mm.

Nestling. "Greyish-buff down, much mottled with dark blackish-brown spots" (*Butler*).

Distribution. India, Ceylon, Burma, the Indo-Chinese countries to Eastern Siberia and the Malay Peninsula and Archipelago. Mathews accepts Leach's *orientalis* as a subspecies occurring from Java Eastwards.

Nidification. This Pratincole breeds in colonies from March to June, laying its two or three eggs on the ground, with no nest, on mud-flats, burnt rice-fields or in the beds of creeks and rivers. In Assam and Burma very favourite resorts are burnt grass-lands and rice-fields, where the half-burnt yellow pieces of stalk are exactly like the eggs themselves. The colonies may number anything from half a dozen to forty or fifty pairs and the noise and commotion the birds make when their eggs are approached soon draws attention to them. They sit very close and often when disturbed from their nests feign illness or wound, flopping along the ground away from the nest in the hope of drawing the intruders attention therefrom. These manœuvres will often be repeated again and again, showing that they are definite reasoned attempts by the bird to save its eggs and not emotional fits caused by sudden fright. The eggs are indistinguishable from those of the preceding bird but perhaps average a trifle lighter. Sixty eggs average 30·8 × 23·9 mm.: maxima **34·2** × **25·3**; minima **28·0** × 22·5 and 31·4 × **21·4** mm.

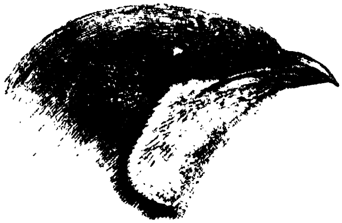

Fig. 18.—Head of *G. maldivarum.* ⅓

Habits. These differ in no way from those of the Collared Pratincole. This species seems to move about locally a great deal. Their breeding colonies in Assam were occupied for a year or two and then the birds disappeared altogether, only to reappear some years later a short distance away.

(2056) Glareola lactea.

THE SMALL INDIAN PRATINCOLE OR SAND-PLOVER.

Glareola lactea Temm., Man. d'Orn., ed. ii, 2, p. 503 (1820) (Bengal); Blanf. & Oates, iv, p. 216.

Vernacular names. None recorded.

Description. Lores and a line round the front of the eye velvet-black; whole upper plumage pale prey, faintly tinged sandy and browner on the forehead; scapulars, inner secondaries and lower and median wing-coverts sandy-grey, the last tipped white; greater and primary coverts black; primaries black, all but the first two or three with a patch of white on the outer webs and sometimes a patch of white on the outer webs of the innermost; secondaries white with black tips broadest on the first, narrowest on the inner; upper tail-coverts white; tail white with a very broad subterminal black band; chin, throat, fore-neck and upper breast sandy-buff changing to pale grey on the breast and flanks; under wing-coverts and axillaries black; remainder of lower plumage white.

Colours of soft parts. Iris dark brown; bill black, red at the base and more yellow on the gape; legs and feet dark brown or plumbeous to black.

Measurements. Wing 142 to 160 mm.; tail 50 to 57 mm.; tarsus 20 to 21 mm.; culmen 9 to 10 mm. Siamese and Burmese specimens are very small, wing 136 to 149 mm. and seem slightly greyer, less sandy in colour but there is so much overlapping both in size and colour that I hesitate to separate them.

Young birds have the feathers of the upper plumage obsoletely edged paler sandy and have the throat and fore-neck spotted with blackish.

Distribution. Ceylon, India and Burma. It occurs in Kashmir but not West of the Indies.

Nidification. This beautiful little Sand-Plover breeds almost always on sand and shingle beds in large rivers, selecting the higher sand-ridges for the purpose. Often the eggs are laid on the bare sand with no cover of any kind but occasionally they may be placed among thin grass or equisetum. No nest is made but a hollow is scraped for the eggs in the sand and often the eggs of the various birds are so close together that it is difficult to avoid treading on them. The colonies run from about a dozen to three or four hundred. The birds are most persistent and I have known them washed out three times by the river rising before they desisted from their efforts to bring up a brood. The eggs number two to four; in some colonies the normal clutch is two, whilst in Assam the full clutch is nearly always four. The ground-colour varies from a grey or green-white to a sandy-buff or sandy olive-green, eggs with a pink tinge being rare. The markings consist of primary specks and small blotches of reddish-brown with secondary ones of lavender; these are scattered fairly numerously all over but generally rather denser at the larger end. Two hundred eggs average 25·9 × 20·5 mm.: maxima 29·2 × 21·0 and 28·5 × 22·0 mm.; minima 23·9 × 19·9 and 25·7 × 19·0 mm.

Habits. These little Pratincoles frequent the larger rivers, where there are wide stretches of sand and shingle and even during the breeding-season associate in large flocks, in winter these combining into still larger flocks of many hundreds. In spite of their short legs they can run with great rapidity, whilst on the wing they are wonderfully fast and most elegant. Their food consists of tiny insects, sand-hoppers, etc., and I have taken very small mollusca from their stomachs. They are common in Kashmir and follow the great rivers up into Kuman and the North-West Himalayas so far as these have suitable sand-banks.

Family DROMADIDÆ.

Schizorhinal; nostrils pervious, perforated in the bill itself and without any membranous operculum; no basipterygoid processes; cervical vertebræ fifteen.

The family consists of one genus of one species, *Dromas ardeola*, a very extraordinary bird with nidification very unlike that of any other member of the *Charadriidæ* and with characters which to some extent link it with the *Ciconiidæ* and other families. I follow Lowe in placing it in the Suborder *Lari-Limicolæ*, though I agree with him also in his opinion that the correct place for this bird is most difficult to decide. It may have to be raised to the status of a suborder.

Genus **DROMAS.**

Dromas Paykull, K. Svensk. Vet.-Ak. Nya Handl., xxvi, pt. 3, p. 182 (1805).

Type by mon., *Dromas ardeola* Paykull.

Bill longer than the head, strong, smooth and compressed; culmen regularly curved; no groove, the nostril being placed in a small depression near the base of the bill; the angle of the lower mandible prominent and close to the base; wing long and pointed, the first primary longest; tail very slightly graduated; tarsi long, shielded in front and behind; half the tibia bare; toes long, the third and fourth joined by a broad web, the second and third by a small one; middle claw broadened and pectinated or notched on the inner dilatation; feathers of interscapulary region lengthened and covering the back.

(2057) **Dromas ardeola.**

THE CRAB-PLOVER.

Dromas ardeola Paykull, K. Svensk. Vet.-Ak. Nya Handl., xxvi, pt. 3, p. 182, pl. 8 (1805) (India); Blanf. & Oates, iv, p. 209.

Vernacular names. None recorded.

Description. Back, long scapulars and greater coverts black; primaries black on the outer webs, pale brownish on the inner and with white shafts; outer secondaries brown on the outer webs, white on the inner; angle of eye behind and before black; remainder of plumage pure white, the tail often remaining pale grey for some time after the rest of the adult plumage is attained.

Colours of soft parts. Iris brown; bill black; legs and feet grey-white to pale glaucous-blue.

Measurements. Wing, ♂ 209 to 225 mm., ♀ 201 to 210 mm.; tail 65 to 75 mm.; tarsus 89 to 100 mm; culmen, ♂ 55 to 61 mm., ♀ 54 to 56 mm.

Young birds have the crown and neck pale grey, the former with black shaft-streaks; back, scapulars and wing-coverts darker grey tinged with brown, the feathers of the back and scapulars edged blackish; tail grey-brown, whiter on the inner webs of the lateral feathers.

Distribution. From the shores of the Red Sea and Persian Gulf, all round—but locally distributed—the coast of India, Ceylon and the Laccadives.

Nidification. The Crab-Plover breeds in May on the islands of rock and sand in the Persian Gulf and Red Sea and in late June on the islands at Adam's Bridge, Ceylon. It nests in colonies, often of great size, scooping burrows anything from one to four feet long in the sand or, occasionally, among the loose boulders and rocks, in which it lays its one pure white egg. This is enormous for the size of the bird and quite unlike the egg of any other Charadriine bird. The texture is smooth and close but not hard and the shape is a long oval, slightly pointed at the smaller end. Thirty eggs average 65·4 × 45·9 mm.: maxima **67·3** × **47·5** mm.; minima **61·0** × 46·2 and 63·5 × **44·2** mm. The eggs cannot be distinguished from some of those of the Shearwaters.

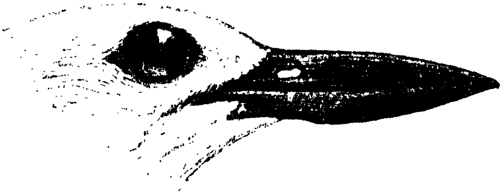

Fig. 19.—Head of *D. ardeola.* $\frac{3}{5}$.

Habits. The Crab-Plover is a sociable bird, collecting and breeding in very large numbers on the islands of the Persian Gulf and, to a less degree, on those of the Southern Red Sea and the islands along the coast of India. It straggles in smaller numbers to the islands of the Bay of Bengal and has occurred in those off the Western coast of the Malay Peninsula. In its habits it is crepuscular and very Plover-like, flying well and running with great speed in short jerky runs. It is said to have a low rather musical call and to feed chiefly on crabs.

Family STERCORARIIDÆ.

The Skuas are parasitic birds, living principally on food robbed from Gulls and Terns, which they very closely resemble. The bill differs from that of the *Laridæ* in being broader at the base, the culmen is greatly curved at the tip, which is bent over the lower mandible; the cere extends over more than half the culmen, the anterior lower portion overhanging the nostril; the lower mandible is nearly straight, the angle near the tip; the claws, though small, are curved and sharp; the anterior toes long and fully webbed, the hind-toe small; the tarsi are long and strong, with scutellæ in front and recticulations behind; the wings are long and pointed with the first primary longest; tail long and rounded, the central rectrices projecting in varying degree.

Skuas have been divided into two or three genera and Mathews* admits three which he bases mainly on the slenderness or stoutness of the bill and the modifications in the central tail-feathers. If we accept these variations as generic, then our family of Skuas must be divided into more than even three genera. On the other hand, the family is a small one and such division does not appear to be of any assistance to the scientific study of the group. I retain our two Indian species in the one genus, *Stercorarius*.

Genus STERCORARIUS.

Stercorarius Brisson, Orn., vi, pp. 149–150 (1760).

Type by taut., *Larus parasiticus* Linn.

Characters those of the family.

Key to Species.

A. Wing under 330 mm.; middle tail-feathers pointed	*S. parasiticus*, p. 96.
B. Wing over 340 mm.; middle tail-feathers rounded	*S. pomarinus*, p. 98.

(2058) Stercorarius parasiticus.

RICHARDSON'S SKUA.

Larus parasiticus Linn., Syst. Nat., 10th ed., p. 136 (1758) (coast of Sweden).
Stercorarius crepidatus. Blanf & Oates, iv, p. 329.

Vernacular names. None recorded.

Description. Dark ashy-brown, the crown still darker and generally showing indications of a paler collar on the hind-neck; below rather paler ashy-brown; shafts of primaries white; tail darker brown, almost black on the ends of the central tail-feathers.

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* Mathews, 'Birds of Australia,' ii, p. 482 *et seq.* (Jan. 31st, 1913).

Another variety has the underparts from chin to posterior abdomen pure white, this white running up and round the hind-neck as a broad collar; there is generally also a narrow white forehead; the white of the neck and sides of the head is glossed with golden-straw colour.

Most birds are definitely coloured according to one or the other of the two above descriptions but many are intermediate and I have seen one specimen in Foula with the whole head pure white just glossed with the golden-yellow. Some specimens agree with the second description but have the breast or some portion of it ashy-brown.

The variations are purely individual and the dimorphic coloration has nothing to do with age or sex.

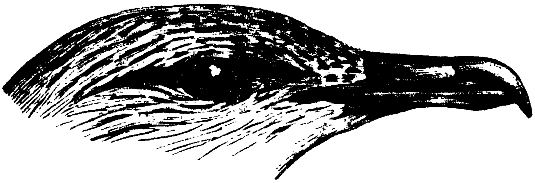

Fig. 20.—Head of *S. parasiticus*, imm. ¾.

Colours of soft parts. Iris hazel-brown; bill blackish- or horny-brown; cere pale greenish-brown; legs and feet brownish-black to black.

Measurements. Wing, ♂ 304 to 326 mm., ♀ 300 to 321 mm; tail 170 to 212 mm; tarsus 40 to 46 mm.; culmen 26 to 32 mm.

Young birds of the all-brown phase are a darker, almost blackish-brown all over, the feathers of the upper parts broadly edged with rufous, this colour occupying the whole of the feathers on the neck and head except on the bases and on a narrow central streak; below, the feathers are both tipped and barred with rufous. Young birds of the brown and white type have the edges to the feathers paler rufescent-white and the underparts barred throughout with white and brown, the breast darker and the chin, throat and fore-neck streaked rather than barred. The iris is grey-blue; the bill light horny; legs and toes pale grey-green or livid, the toes and terminal half of the webs black.

Nestling in down pale sooty-brown above, paler still below.

Distribution. Breeding in the circumpolar sub-arctic regions and in winter wandering South as far as the Cape of Good Hope in Africa, the coast of Sind in India and to Australia, New Zealand and, in America, to Rio de Janeiro.

Nidification. Richardson's Skua breeds from the last week in May to the middle of June, a few birds earlier and still fewer after the 15th of June, except in the extreme North, where eggs may be laid up to the end of the month. It breeds in colonies, often of great size, that of Foula numbers nearly two hundred pairs, occasionally two or three pairs only. No nest is made, the two eggs being deposited in a depression in the moss in swampy land on hillsides. They are typical Gulls' eggs; the ground-colour varies from pale olive, pale stone-yellow or buff to deep olive-green or dark brown, whilst they are spotted and blotched with dark brown. Two hundred eggs average 56·7 × 40·5 mm.: maxima **64·0** × 42·0 and 59·0 × **44·3** mm.; minima **48·7** × 39·0 and 59·6 × **37·2** mm.

Habits. The Skuas live almost entirely on fish etc. which they rob from Gulls and Terns, pursuing them in the air until they drop the desired morsel, which they then seize. They also feed on other birds' eggs and young and often take fish from the fishermen's nets, sometimes being caught in these. They are magnificent fliers, turning and twisting with the greatest elegance and speed, whilst their carriage on land is very haughty and Falcon-like. In defence of their young they are very bold and fierce, attacking intruders before they reach the spot where they are breeding and continuing their assaults until their foes are safely off the premises. Their call is a rather piercing scream but they have many hoarse and guttural notes also and their harsh "gack, gack" is constantly uttered as they sail round in the air.

(2059) Stercorarius pomarinus pomarinus.

THE POMATORHINE SKUA.

Lestris pomarinus Temm., Man. d'Orn., p. 514 (1815) (Arctic Europe).
Stercorarius pomatorhinus. Blanf. & Oates, iv, p. 330.

Vernacular names. None recorded.

Description. (1) Whole plumage brown; almost black on the head, tail and primaries, rather paler below; the primaries are white-shafted. (2) The second phase is very similar to the brown and white phase in Richardson's Skua but the white collar is much narrower and both this and the sides of the head are more strongly glossed with golden-yellow; there is almost always, if not invariably, a broad pectoral band of deep brown, the flanks and sides of the breast are often much barred with brown and there are sometimes traces of dark bars on the abdomen, probably in younger birds only.

Colours of soft parts. Iris brown; bill horny-brown, the cere bluish-grey; legs and feet black.

Measurements. Wing 347 to 380 mm.; tail 170 to 207 mm.; tarsus 48 to 56 mm.; culmen 35 to 40 mm. Females are about as big as males.

Young birds are very like those of Richardson's Skua.

Nestling pale sooty-brown, with a tinge of rufous.

Distribution. The Western Palæarctic Region. A single specimen of this fine Skua was obtained by Col. Tickell at Moulmein. The bird from Eastern Siberia has been separated as *S. p. camtschatica* Pallas.

Nidification. The Pomatorhine Skua breeds from early June to the middle of July and apparently singly or in very small groups, though one large colony is said to breed North of Sukertoppen in Greenland. The eggs are laid in depressions in the moss on the tundras and twenty-three authenticated eggs measure 63·6 × 45·0 mm: maxima **72·6** × 44·9 and 71·0 × **47·0** mm; minima **57·2** × 43·6 and 66·1 × **41·5** mm. They differ from those of Richardson's Skua not only in being larger but also in being comparatively much broader. The colour of the few known seems to be of the brown type of Skua's egg.

Habits. Those of the genus.

Family LARIDÆ.

Lowe keeps the Gulls, Terns and Skimmers in three separate families and I follow him in this in conformity with his general classification of this Order. The three families, however, are very close and Blanford's division of the one family, *Laridæ*, into three subfamilies seems to be equally scientific and sound. In all three families there is no cere to the bill in any of our Indian representatives, the cæca are small and functionless and the sternum has two notches on each side of the posterior margin.

Genus **LARUS**.

Larus Linn., Syst. Nat., 10th ed., i, p. 136 (Jan. 1758).

Type by sub-desig., *Larus marinus* Linn. (Selby, Cat. Gen. & Subgen. Birds, p. 48, 1840).

In this genus the bill is stout, compressed and of moderate length, with the upper mandible longer than the lower, curved and bent down over the tip; nostrils oblong and placed some distance from the base; tarsus moderate or rather short and scutellated in front; anterior toes long and fully webbed, hind toe small; the wings are long, exceeding the tail when closed.

Key to Species.

A. Upper mandible longer than the lower.
  a. A black or brown head in Summer, traces of which usually remain in Winter.
    a'. Mantle pale grey in adults.
      a^2. Wing over 450 mm. . . . . *L. ichthyaëtus*, p. 101.
      b^2. Wing under 350 mm.
        a^3. First primary white with black edges and tip . . . . *L. ridibundus*, p. 102.
        b^3. First primary black with a white subterminal band . . . . *L. brunnicephalus*, p. 103.
    b'. Mantle dark brownish at all stages . . *L. hemprichii*, p. 104.
  b. No black or brown head; mantle grey.
    c'. Wing under 320 mm.; bill and legs red. . . . . *L. genei*, p. 106.
    d'. Wing over 325 mm.; bill and legs yellowish.
      c^2. Mantle dark slaty-grey . . . . *L. fuscus*, p. 107.
      d^2. Mantle pale bluish-grey . . . . *L. argentatus*, p. 108.

(2060) Larus ichthyaëtus.

THE GREAT BLACK-HEADED GULL.

Larus ichthyaëtus Pallas, Reis. Russ. Reichs., ii, p. 713 (1733) (Caspian Sea); Blanf. & Oates, iv, p. 299.

Vernacular names. None recorded.

Description.—Breeding. Whole head and upper neck black, except two white patches above and below the back of the eye; back, rump, scapulars and wing-coverts pale grey, the scapulars and inner secondaries tipped with white; edge of wing and outer greater coverts white; first primary black on the outer web and with a narrow black sub-tip and a broad band about 45 mm. from the tip on the inner web, the rest white; second primary white with a broad black end, one white spot near the tip and the tip itself narrowly white; other primaries white with the terminal quarter black and the tips again white; outer secondaries white; remainder of plumage white.

Colours of soft parts. Iris brown; bill yellow with a black sub-apical band, gape and tip crimson; legs and feet yellow to orange-yellow.

Measurements. Wing 453 to 511 mm.; tail 181 to 196 mm.; tarsus 68 to 80 mm.; culmen 57 to 71 mm.

In Winter the black on the head is lost and the head and neck become white much streaked with black.

Young birds have no black head, the upper parts including the hind-neck are pale brown, each feather edged whitish, the head almost all white: the tail has a broad terminal band of brown, the extreme tip paler; primaries brown with a certain amount of white on the inner webs; outer secondaries brown, narrowly white-edged on the outer webs and with much broader edges to the inner webs.

Nestling in down. Very pale smoky-grey, a few darker stipplings, almost invisible, on the hind-neck and back; below almost white.

Distribution. Breeding from the Caspian Sea to Eastern Turkestan, migrating South in Winter to North Eastern Africa, India and East as far as Amherst in Tenasserim. It has also occurred in Ceylon and Stevens shot one on the Ranganadi River in Assam.

Nidification. This fine Gull breeds during June in South Russia and Central Asia on the shores of the Caspian and Black Sea and on plains adjoining the great rivers and lakes. It lays three eggs in a depression in the ground with little or no nest. In colour they vary from creamy or yellowish-white to pale buff and are thickly blotched and spotted with various shades of brown. They measure about 77·1 × 53·2 mm.

Habits. The Great Black-headed Gull is a bird of inland seas and rivers, its great size and magnificent flight making it a conspicuous bird wherever it occurs. It lives principally on crustacea, offal, fish etc. but has a bad reputation for stealing the young and eggs of other birds. Its call is a very loud, raucous cry, much like that of the Greater Black-backed Gull.

(2061) Larus ridibundus.

THE BLACK-HEADED GULL.

Larus ridibundus Linn., Syst. Nat., 12th ed., i, p. 255 (1766); Blanf. & Oates, iv. p. 300.

Vernacular names. *Dhomra* (Hind.).

Description. Whole head and neck chocolate-brown, deepening to almost black on the hind-neck and below the throat; a ring of white feathers round the eye; back, scapulars, lesser and median wing-coverts and inner secondaries pearl-grey; rump, upper tail-coverts and tail white; outer greater coverts and primary coverts white; first primary white with black tip and black edges to both webs; second and third with less black on the outer web: fourth white on the outer web, grey on the inner, black-tipped; remaining primaries and outer secondaries white, the primaries tipped with black and edged terminally on the inner web with black, this gradually lessening until the innermost is all grey, or nearly so; in freshly-moulted plumage most of the inner primaries have small white tips; under plumage white.

Colours of soft parts. Iris dark brown or crimson-brown; bill and legs deep bright red.

Measurements. "Wing 295 to 315 mm. (one 320), ♀ 285 to 302 mm.; tail 110 to 125 mm.; tarsus 43 to 49 mm.; culmen, ♂ 31 to 36 mm., ♀ 29 to 33 mm." (*Witherby*).

In Winter plumage the dark brown head disappears, though a few feathers show dark here and there in many specimens.

Young birds are brown above, the feathers edged with pale grey; tail white with a broad subapical band of blackish-brown. Specimens occur in every phase of intermediate plumage.

Nestling in down. Buff or brownish-buff, darkest above, palest below; head, back and throat streaked with dark brown.

Distribution. Breeding throughout temperate Europe and Asia from the Faroes to Kamschatka; in Winter South to North Africa, India, China and Japan and also to the Philippines and Malay Peninsula.

Nidification. The Black-headed, or Laughing, Gull breeds from the middle of April, or earlier to the middle of May but, in places where they are much harassed, they will continue laying until June and I have seen fresh eggs in July. It nests in colonies, often of great size, numbering many hundreds or even thousands, on sand-hills, marshes, inland lakes and locks and occasionally on heather-covered dry hills. The nest varies from a scratching in the sand lined with a few scraps of grass to a well-made massive affair of weeds, grass and rubbish. The normal clutch of eggs is three but two often and four occasionally are laid. The colour varies greatly. Most eggs have the ground-colour ranging from pale yellow-stone, grey-green, olive-green, buff, olive-brown or brown to warm rich shades of the same. The markings are generally blotches and spots of dark brown with others underlying of violet and grey. Intruders to the breeding-grounds are greeted with a babel of sounds and as each nest is approached the birds which own them swoop down at them with harsh croaks. Jourdain gives the average of one hundred eggs as 51·9 × 37·2 mm.

Habits. This is a Gull which is often found inland as well as on the coast and it lives largely on worms and insects, following the plough for this purpose. They also eat all sorts of grain, shoots of some crops, seed, beetles, slugs, snails as well as small fish, sand-eels etc., the young being fed almost entirely on these latter. They sometimes also become great thieves of young birds and eggs of other birds. Their two most often used notes are a harsh "gek, gek" and a loud wailing "ka-yek, ka-yek" but they have many other harsh calls and cries. This Gull is resident in most places but wanders far in the Winter and is then not very rare in India, especially on the North-West coast.

(2062) Larus brunnicephalus.

THE BROWN-HEADED GULL.

Larus brunnicephalus Jerdon, Madras J. L. Sci., xii, p. 25 (1840) (India).
Larus brunneicephalus. Blanf. & Oates, iv, p. 301.

Vernacular names. *Dhomra* (Hind.); *Agha* (Tibetan).

Description. Very similar to the preceding bird. The brown of the head is paler, more ashy-brown, less chocolate-brown and showing the dark ring round hind-neck and throat more conspicuously; the first and second primaries are black with a little white at the base and a white spot near the end; the third primary is black with a white bar and from this the white increases in extent and at the same time becomes more grey so that the innermost primaries are grey with black tips.

Colours of soft parts. Iris red-brown or yellow-brown in adults, almost white in the young; bill, mouth, eyelids, legs and feet deep red; in young birds these parts are more yellow or orange and the bill is tipped with dusky.

Measurements. Wing 330 to 348 mm.; tail 139 to 159 mm.; tarsus 49 to 55 mm.; culmen 37 to 45 mm.

In Winter the brown head is lost.

Young birds are like young Black-headed Gulls but the primaries are brownish-black, the outermost having an invisible white base, the white gradually increasing on the inner, which are also tipped white.

Most of our Indian visitors have remains of immature plumage showing, especially on the scapulars and wing-coverts.

Distribution. The Brown-headed Gull breeds on the lakes from Ladak to Eastern Tibet. It nests in large colonies on the shores and islands of the great lakes such as Hramtso at elevations between 12,500 and 15,000 feet. It is said to make a substantial nest when this is on marshy land, putting together a big pad of weeds and rushes but, when on dry ground it lays its three eggs in depressions in the soil or moss, with little or no lining. The eggs vary but little in colour compared with those of most Gulls. The ground may be white, pale yellowish or buffy-cream or, very rarely, greenish, whilst the markings consist of rather large blotches of dark vandyke or reddish-brown with secondary smaller markings of lavender. One hundred eggs average 61·3 × 42·6 mm.: maxima 66·9 × 41·4 and 65·5 × 45·6 mm.; minima 57·1 × 42·7 and 65·0 × 39·1 mm. The breeding-season seems to be from the middle of June to early July.

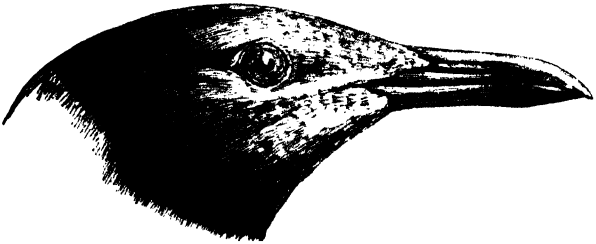

Fig. 21.—Head of *L. brunnicephalus* in breeding plumage. ⅔.

Habits. Ludlow says that this Gull arrives at Gyantse about the middle of March and departs for the plains of Eastern India and Burma in October. Steen says that flight, voice and habits are all very similar to those of *Larus ridibundus*. I have seen flocks of these Gulls on the Brahmapootra in November and again in March but they generally may be seen in pairs or singly all through the Winter months.

(2063) Larus hemprichii.

The Sooty Gull.

Larus hemprichii Bruch, J. für Orn., 1853, p. 106 (Red Sea).
Larus hemprichi. Blanf. & Oates, iv, p. 302.

Vernacular names. None recorded.

Description. A short eyebrow, white; remainder of head smoky-brown, deepening on the back of the nape and lower throat to almost black; a narrow white collar behind the nape and on the sides of the neck; upper plumage and most of the wing-coverts dark ashy-brown, more grey on the extreme upper back next the white collar; upper tail-coverts and tail white; greater coverts tipped white; primaries black, all but the first three or four tipped white, the inner very broadly; outer secondaries dark grey with broad white tips, the inner like the back; breast dark grey; axillaries and wing-coverts dark brown; remainder of under plumage white.

Colours of soft parts. "Iris brown; bill pale greenish-drab, the tip red, divided from the green by a black bar; legs and feet pale yellowish-drab" (*Butler*). "Eye-rim red" (*Ticehurst*).

Measurements. Wing 320 to 348 mm.; tail 139 to 159 mm.; tarsus 50 to 58 mm.; culmen 43 to 48 mm.

In Winter the white and dark collar disappears and the head and fore-neck are paler brown, much mottled and streaked with white.

Young birds have the upper plumage paler and each feather edged with whitish-brown; the tail is brown at first but in the intermediate stage is dirty mottled white with a broad brown subterminal bar.

Nestling. Dull brownish buff above, paler and less brown below; head and neck streaked with dark brown.

Distribution. Southern Red Sea and down the coasts of East Africa to Somaliland, South Arabia, Persian Gulf, Baluchistan, Mekran and Sind, once as far South as Bombay.

Nidification. This Gull breeds on islands off the coast of Mekran, Somaliland and the Southern shores of the Red Sea. Butler's boatmen took big series of eggs from Astola Island, Sir Percy Cox and Pitman took them on Laila and adjacent islands and Archer found them breeding off the coast of Somali. They are said to sometimes make "Crow-like" nests of twigs, weeds etc. on low salt-bushes and at other times to lay their eggs in hollows in rocks or scratchings in the sand with little or no nest. The eggs, which number one to three, are dull and vary little. The ground-colour is pale drab or pale stone to, exceptionally, light brown. Most eggs are marked with large, but sparse, blotches of dark and light brown with secondary smaller marks of lavender. Occasionally they are scrolled instead of blotched. Twenty-four eggs average 56·8 × 47·0 mm.: maxima **66·2** × 41·2 and 62·1 × **45·0** mm.; minima **54·0** × 40·0 and 56·0 × **39·9** mm.

This bird breeds in June, July and August when the heat is really terrific.

Habits. These Gulls are common on the coasts mentioned but leaves there about May when they resort to their breeding-islands. They feed on offal, fish, crustacea, worms etc. and their flight is the normal easy flapping of most gulls. They are said to be very tame.

(2064) Larus genei.

THE SLENDER-BILLED GULL.

Larus genei Brème, Rev. Zool., 1839, pt. i, p. 321 (Red Sea, Africa).
Larus gelastes Blanf. & Oates, iv, p. 303.

Vernacular names. None recorded.

Description.—Breeding plumage. Mantle pale dove-grey; first primary white with black outer web and small tip; second primary white with broader black tip and black edge to inner web; the black increases on each succeeding feather and the white becomes greyer until the innermost primary is grey with a broad black terminal band and just a tiny extreme tip of grey; outer secondaries darker grey than the back; remainder of plumage white with a beautiful rosy tinge everywhere.

Colours of soft parts. Iris pale yellow; bill deep crimson-red; eyelids bright red; legs and feet bright dark red.

Measurements. Wing 280 to 316 mm.; tail 119 to 144 mm.; tarsus 47 to 55 mm.; culmen 38 to 46 mm.

In Winter there is no change of plumage but the rosy tinge is less strong.

Young birds have no rosy tinge; the inner wing-coverts are mottled with brown; the outer primaries are white with brownish black edges to both webs and brown tips; the outer edge gradually disappears and the inner edge increases until the whole of the inner web is brown and the outer grey; the tail is tipped with brown on all but the two outer pairs of feathers. The bill, legs and feet are pale orange.

Nestling in down. White tinged with buff, especially on the head and mottled with black, these mottlings forming fairly well-defined bars on the head and wings.

Distribution. Breeding throughout the Mediterranean, Caspian, Red Sea, the Corsican Gulf and Mekran coast. It occurs on West Coast of Africa as far South as Senegambia.

Nidification. Within our limits the Slender-billed Gull breeds on the Mekran coast and in Sind but its breeding is irregular and, as Ludlow suggests, possibly dependent on rainfall. In years of comparatively heavy rain the lakes are fresh and not suitable for this salt-water-living Gull but in years of scant rainfall, swamps, such as the Sonmeani Bheel, become low and very brackish and are then resorted to by these Gulls in very large numbers. The nests are thick pads of weeds placed on islands in, or on the shores of, the big swamp and the eggs number one to three. On the Sonmeani Bheel Ludlow found the normal clutch to be three but Cox and Cheesman found many single eggs hard-set on islands in the Persian Gulf. The eggs vary very little. The ground-colour ranges from dead-white to very pale buff, cream or yellowish-stone and only in one egg have I seen a greenish tint. The markings consist of blotches, large and small, of dark brown, blackish-brown or reddish-brown, with secondary markings of violet. Scrolls and lines are unusual in the eggs of this species. Two hundred eggs average 55·75 × 38·65 mm.: maxima **63·4** × 42·0 and 58·0 × **43·1** mm.; minima **51·5** × 39·3 and 56·1 × **36·3** mm.

The breeding-season on the Mekran coast is June and July and on the Persian Gulf islands May and June.

Habits. This Gull keeps entirely to salt water and never wanders far inland. It collects in large flocks some distance out at sea, feeding almost entirely on small fish. It has the usual querulous croak of the family and is a noisy bird when feeding.

Larus fuscus.

Larus fuscus Linn., Syst. Nat., 10th ed., i, p. 136 (Jan. 1758).

Type-locality: Sweden.

The typical form is very much darker above than the bird which occurs in India but this race, *taimyrensis*, is very close to *L. f. affinis*, the British form, from which it only differs in being slightly paler on an average and slightly larger. The few specimens in the British Museum seem also to have more grey on the wing-quills and this grey paler and less brown than in *affinis*.

(2065) Larus fuscus taimyrensis.

THE EASTERN HERRING-GULL.

Larus fuscus taimyrensis Buturlin, Mem. Orn. 1911, p. 149 (Yenesei).

Larus affinis. Blanf. & Oates, iv, p. 304.

Vernacular names. None recorded.

Description. Mantle rather dark, slaty-grey, the scapulars and inner secondaries with broad white tips; first primary black with a grey base to the inner web and a large white spot near the tip; second primary black with a wedge-shaped grey mark on the basal half of the inner web and a white tip; on succeeding feathers the grey increases until the 6th primary is grey with white tip and broad subterminal black band; innermost primaries and outer secondaries rather darker grey than the mantle; remaining plumage white.

Colours of soft parts. Iris white to pale yellow; bill yellow with a bright red patch near the tip of the lower mandible: gape and eyelids orange to orange-vermilion; legs and feet pale yellow to orange-yellow.

Measurements. Wing 430 to 463 mm.; tail 161 to 176 mm.; tarsus 67 to 73 mm.; culmen 48 to 60 mm.

In Winter the crown and neck are generally marked with brown, assuming the shape of a demi collar of spots on the nape and sides of the neck.

Young birds have the whole upper plumage dark brown, each feather broadly edged with white, more buffy on the wings; tail dark brown, tipped with white and mottled with white on the basal third; quills dark brown, the wedge-shaped marks of grey replaced by lighter brown and much less in extent; below white everywhere mottled and streaked with dull pale brown. Bill yellow at the base, brown elsewhere; legs dull fleshy-yellow.

Nestling in down. Greyish-buff, streaked and spotted with black on the upper parts and throat.

Distribution. From about the Dwina River in North Russia to the Yenesei. In Winter South to Palestine, Arabia, Mesopotamia and North-West India. In India it occurs not uncommonly on the coasts of Mekran and Sind and has been obtained as far South as Travancore.

Nidification. This Gull nests in colonies on the tundras of Northern Russia and Siberia, making a nest, often of considerable size, of rushes and weeds in a depression in the moss or soil. The eggs number three and are not distinguishable from those of the Western forms of Lesser Black-backed Gulls. Twenty-eight eggs (26 Jourdain) average 70·7 × 48·7 mm.: maxima **80·5** × 50·3 and 72·6 × **51·7** mm.; minima **62·7** × 47·8 and 68·0 × **44·5** mm.

This bird breeds in June and July.

Habits. This is an extremely common Winter visitor to the Mekran and Sind coasts but keeps entirely to the sea, not wandering inland as does the Yellow-legged Herring-Gull. It is a great scavenger and seems to live principally on offal from the ships in the harbonr. It arrives in Sind in September, a few coming as early as August and most have left by the end of May, though a few non-breeding birds of the second year remain throughout the hot weather.

Larus argentatus.

Larus argentatus Pontoppidan, Danske Atlas, i, p. 622 (1763).

Type-locality: Denmark.

The typical form differs from the race found in India and the East in having the legs flesh-colour instead of yellow and the ring round the eye yellow instead of red. The Eastern form is also slightly paler.

(2066) Larus argentatus cachinnans.

THE YELLOW-LEGGED HERRING-GULL.

Larus cachinnans Pallas, Zoog. Russ. As. ii, p. 318 (1827) (Caspian Sea); Blanf. & Oates, iv, p. 305.

Vernacular names. None recorded.

Description. Very similar to the preceding bird but with a much paler mantle and more white on the wings and scapulars; first primary black, a white tip and broad subterminal white bar and the inner web with much grey; succeeding feathers more and more grey: the sixth all grey with a white tip and black subterminal band; remaining primaries and secondaries like the mantle.

Colour of soft parts. Iris white to yellow; bill bright yellow with a vermilion patch near the tip of the lower mandible; orbital ring bright vermilion; legs bright yellow.

Measurements. Wing 415 to 450 mm.; tail 158 to 180 mm.; tarsus 62 to 77 mm.; culmen 49 to 63 mm.

The Winter plumage and that of young birds differ from the adult in the same way as do those of the preceding species.

Distribution. South Europe, Northern Africa, South-West Asia, East to the Bay of Bengal, I have twice shot this species as far inland as Cachar; it is uncommon in Kashmir, whilst from the Mekran coast and Sind to Bombay it is very plentiful.

Nidification. The Yellow-legged Herring-Gull breeds during April and May on rocky islands or the rocky shores of larger areas in the Mediterranean, as well as the shores of lakes and inland waters to Transcaspia. Sometimes the eggs are laid in a mere scrape but Jourdain describes those seen by him in the Mediterranean as substantial nests of branches, grass and weeds. The eggs, two or three in number, vary in ground-colour from pale olive-green to a warm brownish-buff and they are well marked with rather big blotches of blackish-brown, generally more numerous at the larger end. There are also secondary blotches of pale neutral tint. Hartert gives the average of 100 eggs as 70·9 × 49·2 mm.: maxima 86·8 × 46·5 and 70·3 × 53·3 mm.: minima 63·0 × 47·7 and 65·8 × 44·3 mm.

Habits. This Herring-Gull is a common visitor to North-West India along the coast as far as Malabar and it straggles far inland to large rivers and pieces of water. I was surprised to find it twice in Cachar, once on a huge swamp and once on the Barak River, shooting it on each occasion. It feeds on offal, fish, crustacea etc. The one shot in Cachar on a swamp was full of a large red and yellow locust which swarmed on the rushes and water-plants. The call is the same raucous croak as that of the Common Herring-Gull.

Family STERNIDÆ.

The Terns differ from the Gulls in having both mandibles of equal length instead of having the upper longer than the lower. The bill is straight, generally slender with pointed tips; the nostrils are linear; the tail as a rule is long and deeply forked in many species, the outermost tail-feathers attenuated and greatly lengthened; the wings are long, the first primary longest; the legs and feet are small.

The family is cosmopolitan and has been divided into a great many genera, some of which are based on very insignificant characters. For the purpose of this work I recognize six genera, a number sufficient for all scientific purposes, but I include in the genus *Sterna* two forms which are sometimes separated on grounds which are of value even if they do not render the division imperative. *Sterna seena* is placed in a genus, *Seena*, by itself on account of its massive bill, whilst the Sooty Terns are placed in another genus, *Onychoprion*, on account of their rather different plumage and the modified webs to the toes.

Key to Genera.

A. Outermost tail-feathers longest.	
a Tail short, equal to $\frac{1}{3}$ length of wing, fork slight; webs between toes deeply emarginate	CHLIDONIAS, p. 111.
b. Tail about equal to $\frac{1}{3}$ length of wing, deeply forked; webs between toes strongly developed	HYDROPROGNE, p. 115.
c. Tail long, generally more than half wing; webs between toes well developed.	
a'. Bill stout, culmen slightly curved	GELOCHELIDON, p. 116.
b'. Bill moderate, culmen decidedly curved throughout	THALASSEUS, p. 118.
c'. Bill slender, culmen straight or nearly so	STERNA, p. 124.
B. Outermost tail-feathers short; third or fourth from outside longest	ANOUS, p. 145.

Genus **CHLIDONIAS.**

Chlidonias Rafinesque, Kentucky Gazette, xxxvi, No. 8 (Feb. 1822).

Type by mon., *Sterna melanops* = *S. surinamensis* Gmelin.

In this genus the bill is short and slightly compressed; legs and feet small, the webs between the toes deeply emarginate so that the feet appear to be only half webbed; claws long and curved. Wings long, exceeding tail when closed; tail short and very slightly forked; all the species are dark grey or black below during the breeding-season.

Key to Species.

A. Culmen under 33 mm.; crown and nape only black in breeding plumage	*C. leucopareia*, p. 111.
B. Culmen over 33 mm.; crown, nape and underparts black in breeding plumage	*C. leucoptera*, p. 114.

Chlidonias leucopareia.

Sterna leucopareia Temm., Man. d'Orn., 2nd ed., ii, p. 746 (Oct. 1820).

Type-locality: South Hungary.

This form is decidedly paler, both above and below, than in our Indian Whiskered Tern.

Key to Subspecies.

A. Intermediate in colour	*C. l. indica*, p. 111.
B. Palest of the three forms	*C. l. leggei*, p. 113.
C. Darkest of the three forms	*C. l. javanica*, p. 113.

(2067) Chlidonias leucopareia indica.

THE INDIAN WHISKERED TERN.

Viralva indica Stevens in Shaw's Gen. Zool., xiii, pt. 1, p. 169 (1832) (Cawnpore).
Hydrochelidon hybrida. Blanf. & Oates, iv, p. 307.

Vernacular names. None recorded.

Description. Whole upper part of head to extreme hind-neck velvety-black: upper plumage light ashy-grey, the upper back rather darker; first primary dark grey-brown edged internally with lighter grey; second primary silver-grey on the outer web, dark grey-brown with pale grey edging to the inner web; the grey increasing until the inner primaries are all grey, rather darker than the back; secondaries like the back; chin, sides of head and feathers next the black almost white; throat and fore-neck grey, shading away to black on the abdomen, vent and posterior flanks; under tail-coverts and under wing-coverts white, axillaries pale grey.

Colours of soft parts. Iris brown; bill red; legs and feet bright to dark red.

Measurements. Wing 220 to 242 mm.; tail 78 to 82 mm.; tarsus 21 to 22 mm.; culmen 26 to 32 mm.

In Winter the forehead and fore-crown, sides of head, hind-neck and whole lower plumage are white; hind-crown streaked with black and almost wholly black on the nape and in a line from the lores to behind the eye; upper parts much paler grey than in Summer.

Young birds have the crown and mantle brown, the head darkest, each feather broadly edged with mottled rufous; underparts and hind-neck white.

Distribution. All India to the extreme South. Birds from Mesopotamia seem to be nearer to this race than the true *leucopareia* but may possibly belong to yet another and intermediate race occupying Palestine, Arabia and Mesopotamia to Persia.

Nidification. This little Tern breeds in great numbers from Mesopotamia to Western Bengal and all over Northern India. In Southern and Central India it is less common. They make nests of reeds and rushes, more or less mixed with water-weeds and often of considerable bulk, which are built partly or wholly supported by lily leaves and other water-plants on swamps and lakes. The colonies are often of great size, the nests sometimes scattered widely over a great area, at other times placed so closely that they almost touch one another. The eggs number two or three and vary very greatly in colour; the ground-colour ranges from pale to deep stone-colour, yellowish, olive-green, olive-brown or buffy-brown, whilst the markings consist of blotches of blackish-brown, red-brown or light brown, generally fairly dense at the larger end, sparse and more freckly in character elsewhere. Secondary markings are scant and in colour are of a pale grey or neutral tint. Two hundred eggs average 36·9 × 27·4 mm.: maxima **40·8** × 26·4 and 37·0 × **29·3** mm.; minima **34·3** × 27·4 and 35·3 × **20·0** mm. This bird breeds from the middle of May to the middle of July.

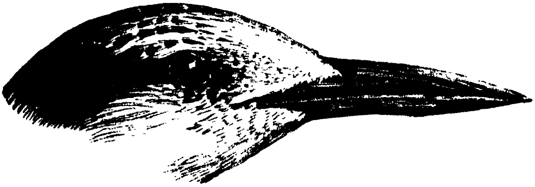

Fig. 22.—Head of *C. leucopareia.* 1/1.

Habits. The Indian Whiskered Tern is a bird of lakes and marshes and, though in the non-breeding season it may be seen on the larger rivers, it seldom resorts to them. It is, however, often found working over rice-fields when the rice is still too young to prevent their fishing. They live principally on water insects and larvæ, dragonflies, grasshoppers etc. but also on fish and tadpoles and are very systematic in their hunting. The whole flock generally works in unison, commencing at the end of a lake and working their way gradually to the other end, when they once more return to their original starting-point. Their flight is most light and elegant, and the sight of a flock feeding is a really beautiful one. The call is a rather soft "jek-jek."

It is a resident bird wherever found but in the driest part of its habitat is absent during the hot-weather months.

(2068) Chlidonias leucopareia leggei.

THE CEYLON WHISKERED TERN.

Chlidonias leucopareia leggei Mathews, Birds of Australia, ii, p. 320 (1913) (Ceylon).
Hydrochelidon nigra. Blanf. & Oates, iv, p. 307 (part.).

Vernacular names. *Muhuḍu-lihiniyā* (Cing.); *Kadal-kuravi* (Tam.).

Description. Similar to *C. l. indica* in size but decidedly paler and with clearer grey breast and underparts. More material is required to confirm Mathews's diagnosis of this race.

Colours of soft parts as in the other races.

Measurements. Wing 215 to 232 mm.; culmen 25 to 31 mm.

Distribution. Ceylon only.

Nidification. This little Tern has not yet been found breeding in Ceylon, though Legge believed that it did so and doubtless its nest will be taken before long on some of the larger tanks and lakes.

Habits. Those of the species.

(2069) Chlidonias leucopareia javanica.

THE JAVAN WHISKERED TERN.

Sterna javanica Horsf., Trans. Linn. Soc., xiii, p. 198 (1820) (Java)
Hydrochelidon hybrida. Blanf. & Oates, iv, p. 307 (part.).

Vernacular names. None recorded.

Description. A very dark bird, the breast and abdomen almost black.

Colours of soft parts as in the other races.

Measurements. Wing 217 to 233 mm.; culmen 28 to 31 mm.

Distribution. Assam, Burma, Malay States to Java and Celebes.

Nidification. The Javan form of this Tern is extremely common in Assam, where it breeds in colonies of many hundreds in the huge swamps of that Province. Nor does it choose only those pieces of water more remote from villages, for one of the largest colonies, numbering probably two thousand pairs, is located in a swamp with Silchar town on one side and villages and cultivated fields on the three other sides. Nests and eggs are like those of the other races but, typically, in this race the dominant colour is brown, whilst in the eggs of *C. l. indica* it is green. Two hundred eggs average 37·0 × 27·2 mm.: maxima **40·3** × 28·1 and 39·0 × **29·1** mm.; minima **35·0** × 28·0 and 36·0 × **26·2** mm.

These Terns breed principally in July but, if the Rains break early, will sometimes commence laying in the end of May, whilst at other times they do not lay until July and continue well into August.

Habits. Those of the species. It is nowhere, so far as is recorded, even locally migratory in its habits.

(2070) Chlidonias leucoptera leucoptera.

THE WHITE-WINGED BLACK TERN.

Sterna leucoptera Temm., Man. d'Orn., p. 483 (1815) (Mediterranean).

Hydrochelidon leucoptera. Blanf. & Oates, iv, p. 308.

Vernacular names. None recorded.

Description. Whole head, neck, lower parts to the vent and upper back velvety-black, shading to blackish-grey on the lower back and scapulars and to dark grey on the innermost secondaries; least wing-coverts and edge of wing white, shading to silver-grey on the median and to dove-grey on the greater coverts; first and second primaries dark brown, with a long wedge-shaped white patch from base almost to the end of the first primary; second and third primaries dark grey, with the usual white wedges; remaining primaries silver-grey on the outer webs, darker on the inner.

Colours of soft parts. Iris dark brown; bill and feet vermilion, darker in winter.

Measurements. Wings 191 to 220 mm.; tail 69 to 75 mm.; tarsus 20 to 21 mm.; culmen 24 to 27 mm.

In Winter only differs from *leucopareia* in its smaller size.

Distribution. Temperate Asia and Europe, in Winter migrating south to all Western India and Ceylon and to Burma, China and nearly all the Malay islands. In India, although common all down the East coast, it is very rare elsewhere but has been found in Raipur in the Central Provinces, whilst Hole, Primrose and I all obtained specimens in Cachar and Sylhet.

Nidification. Very similar to that of the preceding bird. The eggs differ in being much smaller, very much darker and, nearly always, distinctly brown in general tone. Eighty eggs average 34·7 × 24·9 mm.: maxima **37·3** × 26·2 and 34·8 × **27·0** mm.; minima **29·4** × **22·7** mm.

This Tern commences to lay in the last week in April in Spain and in more Northern parts lays up to the end of June.

Habits. Much the same as those of our Indian Whiskered Tern.

Genus **HYDROPROGNE.**

Hydroprogne Kaup, Skizz Entwick. Gesch. Nat. Syst., p. 91 (1829).

Type by mon., *Sterna caspia* Pall.

The genus *Hydroprogne* is distinguished from the next genus, *Gelochelidon*, by its comparatively short tarsi, still shorter tail and by its long, stout bill; it is the largest of all the Terns, recognizable at once by its great size and very large red bill. There is but one species divisible into several races which extends over Europe, Asia and Africa to Australia.

(2071) **Hydroprogne caspia caspia.**

The Caspian Tern.

Sterna caspia Pall., Nov. Com. Acad. Sci. Petrop., xiv, p. 582 (1770) (Caspian Sea).
Hydroprogne caspia. Blanf. & Oates, iv, p. 309.

Vernacular names. *Kekra* (Sind).

Description.—Breeding plumage. Upper part of head black from forehead to nape, including crest; hind-neck white; upper parts pale grey, the rump, upper tail-coverts and tail almost white; primaries darker brown-grey, frosted with silver-grey when new, the inner webs with a pale median line and dark edges and tips; remainder of plumage white.

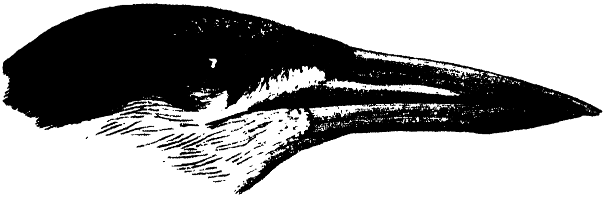

Fig. 23.—*Hydroprogne c. caspia.* $\frac{1}{2}$.

Colours of soft parts. Iris dark brown or hazel; bill coral-red, in Winter duller with a dusky tip; legs and feet black.

Measurements. Wings 380 to 421 mm.; tail 130 to 153 mm.; tarsus about 43 to 48 mm.; culmen 64 to 72 mm.

In Winter the black on the head is replaced by white streaked with black and the white collar on the hind-neck is more conspicuous.

Young birds have no black head and the feathers of upper parts are partly grey barred with brown, especially on the scapulars, inner coverts and innermost secondaries; the tail-feathers and primaries are darker.

Young in down. Above greyish or buffy-white, faintly freckled with dusky black; below white, buffy-white on the fore-neck.

Distribution. Europe, North to lat. 60°, Northern Africa, Western Asia; in Winter to India, Burma and Ceylon.

Nidification. Within Indian limits the Caspian Tern breeds only on the Mekran coast and perhaps some of the adjacent islands, as it also breeds on many islands in the Persian Gulf. On the Sonmeani Bheel Ludlow obtained a fine series of clutches consisting of two and three eggs each. The nests were fairly substantial structures of sticks, rushes and reeds built on the top of the scrubby bushes which grew everywhere on the marsh. No eggs were laid on the ground in this colony but in the Persian Gulf islands they sometimes make nests on the sand and rocks. The eggs vary in colour from a very pale stone to a fairly warm buff but the range is very poor. The markings consist of blotches of dark brown, reddish-brown or purplish-brown, sometimes small but generally of some size and occasionally large and bold. The secondary marks are of grey and purplish neutral tint. Thirty Indian eggs average 64·8 × 46·0 mm. as against 64·0 × 44·5 mm. in one hundred European eggs.

The breeding-season in India and the Persian Gulf is June and the eggs are often destroyed by the intense heat, the half-incubated chicks being killed by the sun if left too long by the parents. It has also been found breeding in Ceylon on the sand-banks of Adam's Bridge.

Habits. When not breeding the Caspian Tern is generally seen singly or in pairs, flying slowly and lazily over big rivers and lakes, hunting for the fish and prawns upon which it feeds. It has a loud harsh cry which the natives of Sind syllabify as "kekra."

Genus GELOCHELIDON.

Gelochelidon Brehm, Vög. Deutchl., p. 771 (1831).

Type by mon., *Sterna nilotica* Gmelin.

The genus *Gelochelidon* differs from *Sterna* in its stouter bill; the tail is comparatively shorter and with the outer feathers less prolonged; the feet are fully webbed as in *Sterna*; the tarsus is longer than the middle toe and claw.

There is only one species, of which the typical form, *G. nilotica nilotica*, occurs in India. I cannot draw any distinction between the European and Indian birds. *G. n. affinis* of Java, with which Mathews links our birds, is paler grey above and is smaller with a decidedly smaller bill. It has occurred in the Andamans.

Key to Subspecies.

A. **Larger, wing 300 to 333 mm.; culmen 35 to 41 mm.** .... *G. n. nilotica*, p. 117.
B. **Smaller, wing 272 to 292 mm.; culmen 32 to 35 mm.** .... *G. n. affinis*, p. 118.

(2072) Gelochelidon nilotica nilotica.

The Gull-billed Tern.

Sterna nilotica Gmelin, Syst. Nat., i, p. 606 (1789) (Egypt).
Sterna anglica. Blanf. & Oates, iv, p. 311 (part.).

Vernacular names. None recorded.

Description.—Breeding plumage. Upper part of head from forehead to hind-nape, including lengthened feathers of nape, velvet-black; upper plumage pale pearl-grey; first primary grey-brown with a long white wedge-shaped mark on the inner web; remaining primaries grey, browner on the inner webs with decreasing wedge-shaped white patches and darker tips; remaining plumage pure white.

Colours of soft parts. Iris brown; bill, legs and feet black tinged with blood-red, this tinge being lost in Winter.

Measurements. Wing 287 (exceptional) to 333 mm.; tail 121 to 148 mm.; tarsus 33 to 37 mm.; culmen 35 to 41 mm.

In Winter the black head is lost, but the white is often streaked with black and a patch of streaky black round the eye and over the ear-coverts nearly always persists.

Young in first plumage have the upper parts, especially the scapulars, inner wing-coverts and innermost secondaries pale brown with buffish edges; the crown is grey or greyish-white and the primaries are darker.

Distribution. Europe as far North as lat. 55°; Northern Africa, Western Asia to India, Ceylon and Burma. In India it breeds in many places in the North-West, Kashmir and probably Ceylon, whence birds have been obtained in full breeding plumage. It occurs over the greater part of Burma and probably breeds on the bigger rivers but its eggs have not actually been taken.

Nidification. The Gull-billed Tern breeds within our limits freely on the larger rivers of North-West India from the Frontier on the Indus to the Gogra in Oude. It has been found breeding in Ceylon, on the Godavery and the Ganges but not farther East. The eggs are laid on sand-banks in the larger rivers and on the shores of lakes and swamps as at Sonmeani on the Mekran coast. The normal full clutch is two or three and the eggs are laid in scratchings in the sand with no pretence at a nest. The eggs vary a good deal; the ground-colour ranges from pale yellowish or greenish stone to a rich warm buffy-brown and they are marked with large blotches of brown, purple-brown or reddish-brown, underlying which are others of grey and lilac. One hundred Eastern eggs average 47·9 × 34·2 mm.: maxima 51·5 × 37·0 mm.; minima 43·5 × 34·0 and 47·0 × 32·4 mm. This bird breeds from April to the middle of May in small colonies, seldom over 40 or 50 couples.

Habits. This Tern is probably resident wherever found, though there may be an influx of migrants in the North-West during the Winter. It frequents the larger rivers, swamps and lakes and is never seen in very large flocks and often singly or in twos and threes. It feeds on insects, small fish, mollusca and, like so many Terns and Gulls, is especially fond of grasshoppers.

(2073) Gelochelidon nilotica affinis.

THE JAVAN GULL-BILLED TERN.

Sterna affinis Horsf., Trans. Linn. Soc., xiii, p. 199 (1821) (Java).
Sterna anglica. Blanf. & Oates, iv, p. 311 (part.).

Vernacular names. None recorded.

Description. Similar to the preceding bird but smaller, with a decidedly smaller bill; the colour above is perhaps a trifle paler but the difference is hardly discernible; the primaries seem to be generally darker.

Colours of soft parts as in the other races.

Measurements. Wing 272 to 292 mm.; tail 91 to 114 mm.; tarsus 30 to 33 mm.; culmen 32 to 35 (once 37) mm.

Distribution. Islands of Malay Archipelago. Once in the Andamans.

Nidification unknown.

Habits similar to those of the preceding bird but apparently more of a coastal and sea bird, less often resorting to the interior of the islands.

Genus THALASSEUS.

Thalasseus Boie, Isis, 1822, p. 563.

Type, *Sterna cantiaca* Gmelin=*S. sandvicensis* Lathom.

This genus is distinguishable from all our Indian Terns by its very long bill, which is slightly curved throughout. The tail is nearly as long as in true *Sterna* and equal to about half the length of the wing; the feet are small and fully webbed; the tarsus is equal to about half the length of the culmen.

The genus has a wide range over the greater part of the Northern Hemisphere and ranges to Australia.

Key to Species.

A. Bill black, tipped yellow .... *T. sandvicensis*, p. 119.
B. Bill yellow.
  a. No white forehead in breeding plumage. Wing under 300 mm. .... *T. bengalensis*, p. 124.
  b. A white forehead in breeding plumage. Wing over 300 mm. .... *T. bergii*, p. 120.

(2074) Thalasseus sandvicensis sandvicensis.

THE SANDWICH TERN.

Sterna sandvicensis Lath., Gen. Syn., Suppl., i, p. 296 (1787) (Sandwich).
Sterna cantiaca. Blanf. & Oates, iv, p. 312.

Vernacular names. None recorded.

Description in Summer. Upper parts of the head from forehead to nape and crest and running under the eye, where it is broken by a white patch, to above the ear-coverts black; upper plumage pearl-grey, whitish on the hind-neck and pure white on the rump and tail; primaries darker silvery-grey on the outer webs, blackish on the inner webs with broad white edges extending to the tip; lower plumage from the lores pure white.

Colours of soft parts. Iris brown; bill black, the tips of both mandibles pale horny-yellow; legs and feet black.

Measurements. Wing 295 to 312 mm.; tail 140 to 161 mm.; tarsus about 27 to 29 mm.; culmen 52 to 56 mm.

In Winter the black crown is replaced by white, some black showing round the eye, streaking the crown and heavily streaking the hind-neck and longer feathers of the creast.

Young birds have the crown and nape black with tiny buff bars turning to white on the nape; hind-neck almost immaculate white; remaining upper parts sometimes tinged with buffy and with broad black bars; below white.

Distribution. Europe and Western Central Asia. In Winter South to Northern Africa and down the coasts to Cape Colony; the Persian Gulf as far South as the Mekran coast and Sind.

Nidification. The Sandwich Tern breeds from the end of May to the end of June, generally in rather small colonies of some dozen to twenty pairs but occasionally in great colonies of many hundreds. Often they associate with other Gulls and Terns and suffer from the depredations of the former. Even when the colonies are very large they split up into smaller groups, a dozen or so pairs laying their eggs in a small sand-hill only a few feet across, similar groups laying ten to twenty yards away from these. They are very careless birds and no other Terns so often destroy their own eggs by sweeping them out of the nesting hollows, whilst few other Terns are so addicted to changing their breeding-quarters for no reason. No nest is made beyond the scratching out of a hollow in the sand but they always select sand-hills or small patches of sand, even though the greater part of their breeding-ground is shingle. The eggs number one or two only and clutches of three—outside collections—are very rare. They are extremely beautiful, the ground varying from pure white to deep salmon, dark brown, bright buff or yellow stone, whilst the markings are generally very bold and handsome, sometimes huge blotches, sometimes clouds and smudges, sometimes small spots or very rarely, scrolls. These may be black, deep purple or reddish-brown or deep red, the secondary marks being of pale lavender. One hundred eggs average 51·7×36·1 mm.: maxima 55·6×36·2 and 53·2×39·0 mm.; minima 44·0×34·7 and 51·0×33·4 mm. (*Jourdain*).

Habits. This is a Sea-Tern and frequents the coast line wherever found, seldom venturing far inland. It has a loud, harsh call, easily distinguishable from the smaller Terns but its flight is quite typical of the family. Its food is almost entirely fish and small mollusca, the young being fed principally on sand-eels.

Thalasseus bergii.

Sterna bergii Lichtenstein, Verz. Doubl., p. 80 (1823) (Cape of Good Hope).

This, the typical form, is separated easily from all others by the pale colour of the mantle, which is also a purer grey with less brown tinge in it. Mathews has gone very carefully into this species in his 'Birds of Australia'*. In this he gives three forms as occurring in India: *S. b. velox* from the Red Sea and occurring as a straggler in India, *S. b. bakeri* from the Mekran coast etc., and *S. b. edwardsi* from Ceylon. In my original review of this genus, when writing my catalogue I rejected *S. b. bakeri* but a further examination shows that this bird has a decidedly stouter bill than *velox* and must be maintained.

Key to Subspecies.

A. Larger; wing 340 to 385 mm., culmen 60 to 71 mm.	
a. Paler	*T. b. velox*, p. 120.
b Darker	*T. b. bakeri*, p. 122.
B. Smaller; wing 300 to 357 mm., culmen 57 to 70 mm.	
c. Darker	*T. b. edwardsi*, p. 122.
d. Paler	*T. b. cristata*, p. 123.

(2075) Thalasseus bergii velox.

THE RED SEA LARGE CRESTED TERN.

Sterna velox Cretzsch., Atlas Reise nord Afr., ii, tab. xiii, p. 21 (Red Sea).
Sterna bergii. Blanf. & Oates, iii, p. 314.

Vernacular names. None recorded.

Description.—Breeding plumage. Upper part of head, from fore-crown to nape, including well-developed crest velvety-black; forehead, hind-neck and edge of wing white; upper plumage grey, tinged ashy: primaries edged black on the outer webs, blackish on the inner webs with broad, white wedge-shaped patch on the outer feathers gradually lessening inwardly and disappearing on the innermost; secondaries white on the inner webs and tipped white; outer tail-feathers with white lores and dark grey tips; rest of plumage white.

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* Mathews, 'Birds of Australia,' ii, p. 340 *et seq.* (Sept. 1912).

Colours of soft parts. Iris dark brown; bill lemon-yellow; legs and feet black, the soles yellowish.

Measurements. Wing 340 to 376 mm.; tail 165 to 205 mm.; tarsus about 34 to 35 mm.; culmen 60 to 71 mm.

In Winter the head is white, the feathers with broad black centres, increasing in size on the nape, whilst the crest-feathers are all black.

Young birds have the upper parts dull brownish-grey, edged brown on the inner webs and buffish on the outer webs.

Distribution. Red Sea and East African coast. One or two specimens from Sind seem to belong to this paler race and have small bills. It is only possible to discriminate between these two races if authentic breeding birds are examined.

Nidification. This fine Tern breeds in great numbers on many of the islands in the Red Sea, off the coast of the whole of Somaliland and probably a good deal farther South. The eggs, which number one to three, varying in the different colonies, are laid in depressions scratched in the sand by the parent birds without any kind of shelter from sun or rain. The breeding-season is from June to August and if the birds leave the eggs exposed to the sun for too long they are rendered infertile and, indeed, sometimes half-cooked. The eggs of this Tern and of the Lesser Crested Tern are probably the most beautiful of all seabirds' eggs, even exceeding in variety of colour and richness of tint the eggs of the Sandwich Tern. The ground-colour varies from pure white through pale cream, salmon, buff or pink to deep warm salmon and buff and even to rich brick-red. The markings are of two kinds: either large bold blotchings of red-brown, purple-brown or blackish-brown, in some being smaller and more speckly; the second type has the same coloured marks in large scrolls and scriggly lines all over the egg. Intermediate forms occur but are rare and in fewer eggs still the markings form clouds and blurred blotches. Secondary markings are few or obsolete and are of grey and pale lavender. One hundred eggs average 62·1 × 43·0 mm.: maxima 66·3 × 44·5 and 63·5 × 45·1 mm.; minima 58·1 × 43·0 and 59·2 × 39·8 mm.

Habits. The Terns of this genus are essentially Sea-Terns and keep exclusively to the sea coast, feeding on small fish, mollusca and, it is said, water insects. Fish they take on the wing, dropping like an arrow into the sea and often wholly submerging themselves in their attempts to seize their prey. Like all the Terns which feed thus, they fly along with bill held straight down as they watch for their dinner; for a moment or two they hover with widespread tail and beating wings and then with a demi-somersault plunge down to the water. Their cry is a hoarse and loud edition of that of the Common Tern, very much like that of the Sandwich Tern but still louder and of a deeper tone.

(2076) Thalasseus bergii bakeri.

THE MEKRAN LARGE CRESTED TERN.

Thalasseus bergi bakeri Mathews, Birds of Australia, ii, p. 346 (Sept. 1912) (Mekran coast).
Sterna bergii. Blanf. & Oates, iv, p. 314 (part.).

Vernacular names. None recorded.

Description. Similar to the preceding but breeding birds are darker and they are also slightly larger and have decidedly stouter bills.

Colours of soft parts as in the other races.

Measurements. Wing 333 (exceptional) to 385 mm.; tail 150 to 205 mm.; tarsus 33 to 35 mm.; culmen 61 to 70 mm.

Distribution. Sind, Mekran coast and Persian Gulf.

Nidification. This Crested Tern breeds from May to July on the islands of the Persian Gulf and off the Mekran coast. In some of these islands the colonies number thousands, in others two or three hundred only. Eggs and nests resemble those of the preceding bird. One hundred average 67·5 × 42·5 mm.

There are also breeding-places of this species of Tern off the northern coast of the Bay of Bengal from the Sunderbands to the coast of Akyab, but these all probably belong to the smaller race, *edwardsi.*

Habits. Similar to those of the preceding race. More material for comparison of the races is badly wanted by the British Museum, especially from the East Indian and Burmese coasts.

(2077) Thalasseus bergii edwardsi.

THE CEYLON LARGE CRESTED TERN.

Thalasseus bergii edwardsi Mathews, Birds of Australia, ii, p. 347 (Sept. 1912) (Ceylon).
Sterna bergii. Blanf. & Oates, iv, p. 314 (part.).

Vernacular names. *Muhudu lihiniyā* (Cing.); *Kadal-kuravi* (Tam.).

Description. In colour as dark as *T. b. bakeri* but smaller.

Colours of soft parts as in the other races.

Measurements *. Wing 300 to 355 mm.; culmen 58 to 66 mm.

Distribution. Ceylon and the Laccadives, Assam, Bengal, the Burmese coasts to the Mergui Archipelago.

Nidification. This race of the Crested Tern breeds on the islands off the coast of Ceylon, making no nest but laying its eggs either in hollows in the sand or on the bare rock. Only one egg is laid, just like those of the other races, except that the deep pink and salmon type is unusual, many of the eggs being quite white in ground and ranging from this to pale cream, buff or pink. Twenty eggs average 60·0 × 42·4 mm.: maxima **64·2** × **44·2** mm.; minima **54·9** × **40·3** mm.

Parker found them breeding on Adam's Bridge in June but Wait and Phillips obtained eggs on the 30th of April and 5th of May respectively.

Habits. A resident bird with the usual habits of the species.

(2078) Thalasseus bergii cristata.

THE CHINESE LARGE CRESTED TERN.

Sterna cristata Stephens, Gen. Zool. (Shaw), xiii, pt. 1, p. 146 (1826) (China).
Sterna bergii. Blanf. & Oates, iv, p. 314 (part.).

Vernacular names. None recorded.

Description. A small race very similar to *T. b. edwardsi* but paler above.

Colours of soft parts as in the other races.

Measurements. Wing 322 to 357 mm.; culmen 59 to 67 mm.

Distribution. Coasts of China, Indo-Chinese countries and the islands of the Mergui Peninsula.

It is with some hesitation I admit this race to our Avifauna but two specimens from Southern Tenasserim, possibly casual visitors only, seem nearer to it than to *edwardsi*, which is the breeding bird in that locality.

Nidification. In 1896 I received from an island in the Mergui Peninsula skins and eggs of a Crested Tern which were possibly of this race, whilst Williamson and Herbert took eggs on small islands in the Gulf of Siam. They found single eggs laid on the bare rock with no nest. Thirty-two eggs average only 58·7 × 41·8 mm.; much smaller than the eggs of other races.

Habits. Those of the species.

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* Non-breeding birds occasionally wander great distances and make measurements sometimes unreliable. Thus a dark bird with a wing of 385 mm. was obtained off the Malay coast. Another difficulty is the large number of unsexed birds in the British Museum collection. Measurements of sexed breeding birds make the differences of the various races much more distinct.

(2079) Thalasseus bengalensis bengalensis.

THE INDIAN LESSER CRESTED TERN.

Sterna bengalensis Lesson, Traité d'Orn., p. 621 (1831) (Indian coasts).
Sterna media. Blanf. & Oates, iv, p. 313.

Vernacular names. None recorded.

Description. Very similar to the preceding Tern but much smaller. The upper parts are a much paler grey and the black of the crown extends to the whole of the forehead.

Colours of soft parts. Iris brown; bill yellow to orange-yellow; legs and feet black, soles yellowish.

Measurements. Wing 271 to 295 mm.; tail 130 to 139 mm.; tarsus about 27 to 29 mm.; culmen 50 to 57 mm.

Birds in Winter plumage and **Young** differ from the adult in the same way as do those of *T. bergii.*

Distribution. The coasts of India and Ceylon, extending to Burma.

Nidification. This Crested Tern breeds from the end of May to early July in many of the islands in the Persian Gulf, laying one to three eggs on the sand in shallow depressions or on bare rocks. There is no lining to the nest hollow and no attempt is made at concealment or protection from the sun, the birds laying in large colonies quite in the open. The eggs only differ from those of the Large Crested Terns in being much less richly coloured, very seldom scrolled and much smaller. One hundred eggs taken at random from the huge museum series collected by Col. A. E. Butler average 53·4 × 36·4 mm.: maxima **62·7** × 33·1 and 56·8 × **38·2** mm.; minima **47·5** × 34·6 and 49·8 × **33·0** mm.

Habits. Similar to those of the larger species of this genus.

Genus STERNA.

Sterna Linn., Syst. Nat., 10th ed. i, p. 137 (Jan. 1758).

Type by sub. desig., *Sterna hirundo* Linn.

This genus has been split up into very many genera by various authorities; by some practically a genus is given for every species. Most of these genera are founded on very trivial characteristics and seem quite unnecessary, only making the task of the student more difficult, whilst adding nothing to the science of ornithology. A doubtful exception is that of *Sterna aurantia,* which has been separated as a genus, *Seena,* on account of its stouter bill. This is, however, only a question of degree and I retain it in *Sterna.*

In this genus the bill is normally rather long, slender and straight and more or less compressed; the tarsus is shorter than the middle toe and claw; the feet are small and fully webbed;

the wings are long and pointed, the first primary longest; the tail is always deeply forked but the length of the attenuated, lengthened outer feathers varies greatly.

Terns are found all over the world and are strongly represented in India, where we have ten species which are again divided into many geographical races.

Key to Species.

A. Mantle grey.
  a. Crown black during the breeding-season.
    a^1. Wing over 200 mm.
      a^2. Tarsi yellow or red.
        a^3. Bill orange-yellow.
          a^4. Bill stout; wing over 250 mm.; abdomen white .... *S. aurantia*, p. 125.
          b^4. Bill slender; wing under 240 mm.; abdomen black in the breeding-season .... *S. melanogaster*, p. 127.
        b^3. Bill deep or dusky red.
          c^4. Lower parts deep vinaceous-grey .... *S. repressa*, p. 128.
          d^4. Lower parts pale grey or white; outermost rectrices with dark grey outer webs .... *S. hirundo*, p. 129.
          e^4. Lower parts white or rosy; outermost rectrices nearly all white.. *S. dougalli*, p. 132.
      b^2. Tarsi blackish .... *S. h. longipennis*, p. 131.
    b^1. Wing under 200 mm. .... *S. albifrons*, p. 135.
  b. Crown always white, nape and line through eye black; bill black; tarsi dark brown. *S. sumatrana*, p. 139.
B. Mantle dark brown.
  c. Wing under 265 mm. .... *S. anætheta*, p. 141.
  d. Wing over 275 mm. .... *S. fuscata*, p. 143.

(2080) Sterna aurantia.

THE INDIAN RIVER-TERN.

Sterna aurantia Gray, Illus. Ind. Zool., i, pl. 69, fig. 2 (1831) (India).
Sterna seena. Blanf. & Oates, iv, p. 315.

Vernacular names. *Kinai* (Sind).

Description. A patch below the eye white; upper part of head to below this white patch and including nape and crest black glossed with green; remainder of upper plumage French grey, paler on the rump, upper tail-coverts and tail almost white on the prolonged outermost tail-feathers and silvery-grey on the outer webs of primaries, secondaries and the outer wing-coverts; lower plumage pale grey, a streak under the black cap on the cheeks, under-wing and tail-coverts white.

Colours of soft parts. Iris brown; bill bright deep yellow, duller in Winter and with a darker tip; legs and feet red.

Measurements. Wing 260 to 280 mm.; tail 178 to 228 mm. tarsus about 20 to 22 mm.; culmen 39 to 43 mm.

In Winter the black cap is replaced by white or greyish-white, a certain amount of black nearly always showing in the cheeks and through the eye; the nape is also nearly always more or less streaked with black.

Young birds have the upper plumage, including wing and tail-feathers, edged with buffy-white and subedged terminally with blackish; the forehead and a broad supercilium are immaculate white.

Distribution. On all large rivers throughout India and Burma and throughout the Malay States to Singapore.

Nidification. The River-Tern breeds on all the larger rivers of Northern India and Burma and less commonly in the South. The colonies are sometimes of great size, numbering many hundred, the birds often breeding on sand-banks in company with other Terns, Spur-wing Plovers, *Glareola lactea* and the Stone-Curlew. No nest is made beyond a hollow scratched in the sand but this is rather unusually deep and they always select sand, not shingle, for their nesting-sites. Three is the normal full clutch, sometimes two only and more rarely four. They are on the whole dull-coloured eggs, the ground-colour pale stone or buff and the markings blotches and spots of dull brown, reddish-brown and purplish-brown with others underlying of neutral tint. In shape they are broad obtuse ovals. Two hundred eggs average 42·0 × 31·4 mm.: maxima 45·3×40·0 mm.; minima 38·0×30·2 and 40·3×29·3 mm.

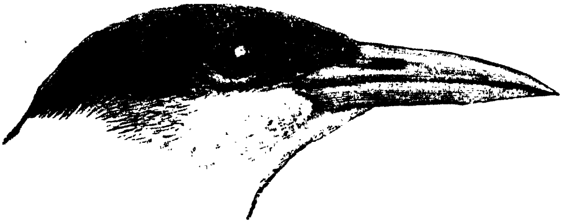

Fig. 24.—Head of *S. aurantia.*

The breeding-season is from March to April, rarely May, whilst Ticehurst found them breeding on a canal in Sind during August.

Habits. This Tern keeps entirely to our larger rivers, though it may be also found fishing on the swamps and lakes immediately in the vicinity of these. Like all Terns they give away their nesting-sites by wheeling backwards and forwards over them throughout the day, uttering their harsh cries as they fly and boldly attacking any intruder in the way of hawk, dog or even human being. Their food is almost entirely fish but they also eat small crustacea, tadpoles, water insects etc.

(2081) Sterna melanogaster.

THE BLACK-BELLIED TERN.

Sterna melanogaster Temm., Pl. Col., pl. 434 (1827) (Ceylon)
Blanf. & Oates, iv, p. 316.

Vernacular names. None recorded.

Description. Upper part of the head from the forehead to nape and crest glossy black, the extreme point of the forehead sometimes white; upper plumage grey, faintly tinged ashy, more so on the innermost secondaries; rump, upper tail-coverts and tail paler, the outer web of the long outermost tail-feathers nearly white; lores, cheeks, chin and throat pure white, shading into grey on the upper breast and thence to black on the lower breast, abdomen and under tail-coverts; under wing-coverts and axillaries white.

Colours of soft parts. Iris dark brown; bill orange-yellow, duller and tipped with dusky in the non-breeding season; legs and feet orange-red, claws black.

Measurements. Wing 221 to 240 mm.; tail 145 to 152 mm.; tarsus about 15 to 16 mm.; culmen 32 to 40 mm.

In Winter the upper part of the head is white streaked with black and there is a black patch behind the eye; lower parts white tinged with grey on the breast and fore-neck.

Young birds have the upper plumage buffy-grey, edged paler buffy-white and subedged blackish; the innermost secondaries have a second dark bar following the subterminal one.

Distribution. Practically throughout India and Burma but more rare in the South, whilst Wait does not admit it as a Ceylon bird.

Nidification. Very similar to that of the River-Tern, in company with which it often breeds, though the colonies keep separate. There is no prettier sight than hundreds of these little Terns performing evolutions over their breeding-places, their flight being most graceful and their energy inexhaustible. They nearly always select bare, open sand-banks but occasionally breed among very thin *equisetum* or grass. On the same sand-bank in the Brahmapootra I have seen hundreds of the River-Tern breeding on one end, many more hundreds of this little Tern at the other, whilst on the higher ground and on shingle an equally numerous colony of Swallow-Plovers were nesting. They breed in February, March and April, laying three or, not very infrequently, four eggs. In shape these are very broad obtuse ovals and in colour some shade of sandy-buff, spotted, speckled or blotched with light brown or reddish-brown, so that on dark sand they are very inconspicuous. A few eggs are greenish in colour and fewer still have a white ground. One hundred eggs average 32·4×24·9 mm.:

maxima **35·8×25·1** and 31·8×**26·0** mm.; minima **30·2**×25·1 and **33·3×23·4** mm.

Habits. Very much the same as the River-Tern, though these birds more often frequent large lakes and swamps and I have seen them fishing over flooded rice-fields. Its food is almost exclusively tiny fish and its cry is a shrill, but pleasant, "krek-krek," constantly uttered as they fly about. When fishing these Terns often disappear completely under water.

(2082) Sterna repressa.

THE WHITE-CHEEKED TERN.

Sterna repressa Hartert, Nov. Zool., 1910, p. 288 (Persian Sea).
Sterna albigena. Blanf. & Oates, iv, p. 317.

Vernacular names. None recorded.

Description. Upper parts of head including upper lores but not running under the eye black; upper plumage dark ashy-grey, rather paler on the upper tail-coverts and tail; first primary nearly black on the outer and inner web with a broad white edge to the latter, succeeding primaries silvery grey, the inner webs finely edged whitish, subedged black and paler next the black; chin and cheeks pure white, shading into pale vinous-grey on the throat and sides of the neck and to darker vinaceous on the breast, abdomen and posterior flanks; under wing-coverts, tail-coverts and axillaries white.

Colours of soft parts. Iris brown; bill dark blood-red at the base, black on the terminal half with a microscopic pale tip; legs and feet bright red.

Measurements. Wing 227 to 254 mm.; tail 124 to 154 mm.; tarsus about 19 to 21 mm.; culmen 36 to 38 mm.

In Winter the head is white, the feathers round the eye, nape and upper hind-neck more or less black or chocolate-brown; lower hind-neck and lower plumage white.

Young birds have the quills darker brown, the upper parts mottled with brown; hind-neck and lower plumage white. Young birds in first plumage have not been described.

Distribution. Sea coasts from the Red Sea and Persian Gulf to Ceylon and the Laccadives.

Nidification. Miss Jackson found the White-cheeked Tern breeding during August on Kiemboni Island, East Africa but in the Persian Gulf Sir Percy Cox and others obtained eggs in May and June. The hollows for the eggs are scratched in sand and occasionally a few scraps of twig are placed as a lining, at other times they are just laid on the bare rock. The eggs number one or two, more often the former. In shape they are broad blunt ovals, though not so broad as those of either of the two preceding species. The ground-colour is a pale stone or yellowish-grey in nine eggs out of ten, with small specks and spots of pale reddish to dark reddish-brown with underlying spots of neutral tint. A few eggs have a pale salmon or buff ground and still fewer brown or dark buff. A series collected by Miss Jackson are noticeable on account of their bold marking with deep brown blotches and spots. One hundred eggs average 40·8 × 30·4 mm.: maxima **45·3** × 28·2 and 43·9 × **33·7** mm.; minima **37·0** × 28·1 and 40·0 × **28·0** mm.

Habits. The White-cheeked Tern is extremely common throughout its breeding habitat and in the Winter it occurs frequently on the West coast of India as far as Malabar. Off the Mekran coast and Sind it is common and resident, breeding on the adjacent islands. It is essentially a sea-bird, often being met with at great distances from the nearest land.

Sterna hirundo.

Key to Subspecies.

A. Bill and legs red.	
a. Purer grey above and below and distinctly paler below in breeding plumage	*S. h. hirundo*, p. 129.
b. Browner grey above and below and decidedly darker below in breeding plumage	*S. h. tibetana*, p. 130.
B Bill and legs black	*S. h. longipennis*, p. 131.

(2083) Sterna hirundo hirundo.

The Common Tern.

Sterna hirundo Linn., Syst. Nat., 10th ed., i, p. 137 (1758) (Sweden).
Sterna fluviatilis. Blanf. & Oates, iv, p. 318 (part.).

Vernacular names. None recorded.

Description. Whole crown black to nape and end of crest; back and wings grey; the greater coverts tipped white; first primary blackish, the inner web broadly edged with white; second more grey with the edge of the inner web near the tip brownish-black, the succeeding feathers more grey with less white on the inner webs; rump and upper tail-coverts white; tail white, the outer webs of the outermost feathers blackish and of the others grey; lower plumage white, suffused with vinous-grey from the breast to the vent.

Colours of soft parts. Iris dark brown; bill coral-red, broadly tipped with blackish; legs and feet coral-red.

Measurements. Wing 254 to 286 mm.; tail 130 to 172 mm.; tarsus about 20 to 21 mm.; culmen 35 to 39 mm.

In Winter the forehead, fore-crown and upper lores are white streaked more or less with black, especially on the nape, which is often wholly black; lower parts white. The bill is duller and blackish and the feet also duller red.

Young birds have the upper parts buff barred with dark brown and the feathers margined paler; the forehead and fore-crown is brownish-buff, the hind-crown streaked with black and the nape all blackish; the lower plumage white; bill blackish, feet blackish-red.

Nestling in down. Above pale sandy or buff, the crown marked with black, generally, in two fairly well-defined lateral bands and a less well-defined central one; back mottled with black; throat and fore-neck purplish-brown, paler on the chin, rest of down on under parts white.

Distribution. Temperate Europe and Asia, extending South in Winter to North-West India and Northern Africa. Within our limits it occurs on the Mekran and Sind coasts and probably most of the Terns of this species wintering on the West coast of India are of this race, whilst those found inland and Eastwards are of the Tibetan race.

Nidification. The Common Tern breeds in Mesopotamia but not nearer than this to India. In most countries it is a shore-breeder but in Mesopotamia and West Central Asia it breeds on the shores of the great lakes and swamps. The nest is a scratching in the sand or mud, sometimes entirely unlined, sometimes with quite a good nest of grass etc. The eggs number two or three and vary very greatly in colour. Normally the ground may be pale stone, pale greenish, pale olive-, buff- or yellow-brown and range from this to deep tints of the same, speckled, spotted or blotched with various shades of red-browns and browns. Exceptional eggs may be of almost any colour, from unspotted pale blue to pink blotched with blood-red. One hundred British eggs average 41·2 × 30·3 mm.

The breeding-season is from the last few days of April to the end of June, the vast majority of English birds laying between the 25th of May and the 10th of June.

Habits. A very sociable bird, being found in large flocks throughout the year, living almost entirely on fish, sand-eels and aquatic insects, which it obtains by diving from a height into the water.

(2084) Sterna hirundo tibetana.

The Tibetan Tern.

Sterna tibetana Saunders, P. Z. S., 1876, p. 649 (Tibet).
Sterna fluviatilis. Blanf. & Oates, iv, p. 318 (part.).

Vernacular names. *Dao-kekra* (Cachari).

Description. Differs from the preceding race in being slightly darker both above and below, a distinction which is very apparent if breeding birds from Tibet are compared with breeding birds of the typical race.

Colours of soft parts as in the preceding race.

Measurements. Wing 245 to 279 mm.; tail 145 to 156 mm.; tarsus about 19 to 22 mm.; culmen 34 to 38 mm.

Birds in Winter plumage and **young birds** are indistinguishable from the preceding race.

Distribution. Ladak, Tibet and Central Asia.

Nidification. The Tibetan Tern breeds on the great lakes and some of the rivers of Ladak, Tibet and Central Asia, its nest and eggs being exactly like those of the Common Tern, though the latter do not vary to the same extent. At present, however, there are but few of them known and larger series might show greater variation. A series of forty-five collected for me on the Hramtso Lake in Tibet are nearly all of the dull brown or grey-green type and in size average 41·9 × 30·5 mm.: maxima **47·4** × 31·1 and 42·2 × **32·2** mm.; minima **39·1** × 30·0 and 41·0 × **29·0** mm. These were all taken from a colony breeding in Tibet at 12,500 feet, and they breed from this elevation up to at least 15,000 feet. I was informed that the birds made quite substantial nests of reeds and rubbish and did not lay their eggs on the bare mud-flats which surround these lakes. My series were taken about the 26th of June but at this time many young had been hatched and the eggs sent were all advanced in incubation. In North-East Chihli La Touche obtained ten eggs in July from the coast.

Habits. The Tibetan Tern is a very common visitor to the whole of Western and Central India, wandering as far South as Ceylon. It occurs throughout Burma and also in the Malay States. It is impossible to distinguish Winter and young birds of this race from the Common Tern, so that records are very mixed but there is little doubt that the whole of our Eastern records should apply to this bird only. The Tibetan Tern is as much, or more, a lake and river Tern than a coastal bird and keeps to the larger rivers, where it may be seen fishing in the shallows, either singly or in pairs or small flocks. In flight, voice and diet it differs in no way from the Common Tern.

(2085) Sterna hirundo longipennis.

NORDMANN'S TERN.

Sterna longipennis Nordmann, in Erman's Reise, p. 17 (1835) (Ochotok); Blanf. & Oates, iv, p. 319.

Vernacular names. None recorded.

Description. About the same in colour as the Tibetan Tern but always distinguishable in breeding plumage by its wholly black bill and feet. It is rather darker both above and below than the Common Tern, whilst it is decidedly smaller with a smaller bill.

Colours of soft parts. Iris brown; bill and feet black.

Measurements. Wing 230 to 272 mm.; tail 110 to 130 mm.; tarsus 19 to 21 mm.; culmen 29 to 35 mm.

Birds in Winter plumage and **young birds** resemble the preceding subspecies except for their black feet and bill.

Distribution. From Lake Baikal to the extreme East of Siberia and Japan and along the Chinese coast. In Winter it wanders South and West into South China, the coasts of the Indo-Chinese countries and once as far as Ceylon.

Nidification. Owston's collectors found breeding colonies of this Tern in Sakhalin on the coast. They were breeding just above high water on the line of the extreme tide, the eggs being laid in the rubbish thus formed. Each nest contained three eggs which can be exactly matched by many of the Common Tern. The ground-colour is pale yellowish-stone, pale olive, rather dark olive-green or light brown and they are all well blotched with dark reddish-brown and secondary blotches of neutral tint, more numerous at the larger end. The average of twenty-five eggs is 42·7 × 30·0 mm.: maxima **46·0** × 31·4 and 43·0 × **32·5** mm.; minima **38·3** × **28·6** mm. Owston took all his eggs in June but in Kamtschatka eggs were obtained on the 4th of May.

Habits. Much the same as those of the Common Tern. This Tern frequents both the larger inland lakes and marshes and the sea coast, feeding entirely on fish and aquatic insects and keeping in flocks at all times.

Sterna dougalli.

Sterna dougalli Montagu, Orn. Dict. Suppl., 1813.

Type-locality: Scotland.

Our Indian bird may be distinguished from this, the typical form, by its slender bill and slightly darker plumage.

(2086) Sterna dougalli korustes.

THE EASTERN ROSY TERN.

Sterna korustes Hume, Str. Feath., ii, p. 318 (1874) (Andamans).
Sterna dougalli. Blanf. & Oates, iv, p. 319.

Vernacular names. *Muhudu lihiniyā* (Cing.); *Kadal kuruvi* (Tam.).

Description. Upper parts of head to nape and crest black, running just below the eye, where it is interrupted by a white patch; a collar on hind-neck white; upper parts pearl-grey, palest on the rump and upper tail-coverts; outermost tail-feathers pure white; first three primaries blackish with a broad white edge to the inner webs; remaining primaries and secondaries pearl-grey, edged inwardly with white; lower plumage white suffused with delicate pink.

Colours of soft parts. Iris dark brown; bill red, tipped blackish or with the terminal third blackish; legs and feet bright red.

Measurements. Wing 210 to 226 mm.; tail 130 to 164 mm.; tarsus about 20 to 22 mm.; culmen 31 to 38 mm.

In Winter the forehead and fore-crown are marked with white; the pink flush on the lower plumage is duller and nearly disappears.

Young birds have the upper parts white with double bars of brown; the crown streaked and the forehead spotted with brown, black and white; the rump and upper tail-coverts ashy-grey, sometimes mottled or speckled with brown; underparts white.

Nestling in down. Upper parts, chin and throat grey tinged with buff or rich buff, the bases of the down black and showing through; underparts white.

Distribution. Ceylon, Andamans and the islands of the Mergui Peninsula.

Nidification. The Eastern Rosy Tern breeds in large colonies of two hundred pairs and over in the Andamans and Ceylon, in the former during June and in the latter in April and early May. Wait and Phillips describe the nests as varying from scrapes, with little or no material as lining, to well-made pads of grass. One colony is said to have taken possession of the leeward side of an island of about an acre, where the beach shelved down to the water. Some nests were in the open and others among grass growing six inches to a foot high. The eggs numbered one or two, very rarely three and are like those of the European Rosy Tern, smaller, more speckled and less heavily blotched as a rule than the eggs of the Common Tern. In shape also they are typically longer, more pointed eggs. One hundred eggs average 40·2 × 29·3 mm.: maxima **46·8** × 28·9 and 42·1 × **31·3** mm.; minima **34·8** × **26·4** mm.

In the Andamans this Tern and *Sterna sumatrana* breed together, whilst in the Ceylon islands it breeds with *Thalasseus bergii edwardsi,* though the latter commences laying some three weeks later.

Habits. This is purely a Sea-Tern, being confined to the coast-line and adjoining islands. It is resident wherever found but in the non-breeding season it scatters along the coast and among many islands, concentrating again in particular spots before breeding starts. The call is decidedly softer than that of the Common Tern but when disturbed while breeding they scream harshly as they wheel round and round the intruder. Their diet is almost exclusively small fish.

Sterna albifrons.

The Little Tern is a species which has been most difficult to divide into its various geographical races, principally because of its great propensity to wander far afield from its proper breeding-area, so that in the non-breeding season we may have two, three or even more races found together in one place. Hume divided his birds into species, subspecies at that time not being admitted, upon the colour of the shafts of the primaries, a very important characteristic, together with certain other features.

In Indian limits we appear to have five forms:—the typical *S. a. albifrons*, which is a casual straggler only into India in Winter; *S. a. sinensis*, a coastal breeding bird with an immense area stretching from Ceylon to Eastern China; *S. a. pusilla*, a river-breeding Tern found over most of India and Burma; *S. a. saundersi*, a very local form found over the Southern Red Sea and Persian Gulf to Sind and the Mekran coast and, finally, a fifth form which breeds in Mesopotamia, the Persian Gulf and Mekran, which, whilst most nearly allied to the European bird, is superficially very like *saundersi*.

Key to Subspecies.

A. Bill larger; culmen 28 to 34 mm.; much stouter.
  a. First primary with pale brown shaft, second and sometimes third darker brown; rump and upper tail-coverts quite white .... *S. a. albifrons*, [p. 135.
  b. First primary with very white shaft, second and sometimes third with pale brown shafts; rump and upper tail-coverts almost white .. *S. a. sinensis*, [p. 136.
B. Bill smaller; culmen 26 to 32 mm.; much more slender.
  c. First and second, and sometimes third primary with dark shafts; rump, upper tail-coverts and tail concolorous with grey of back .... *S. a. prætermissa*, [p. 138.
  d. First primary with whity-brown shafts, second a little darker; rump and upper tail-coverts almost concolorous with back .... *S. a. pusilla*, [p. 137.
  e. First three primaries with black shafts; rump and upper tail-coverts concolorous with back .... *S. a. saundersi*, [p. 138.

The distinctions given apply only to birds in full breeding plumage. It must, however, be remembered that birds wear the Winter plumage for a brief season only and that specimens in full Summer plumage may constantly be met with very far from their true breeding-haunts.

(2087) Sterna albifrons albifrons.

THE LITTLE TERN OR TERNLET.

Sterna albifrons Vroeg, Cat. Verzam. Vögel Adum., p. 6 (1767) (Holland).
Sterna minuta. Blanf. & Oates, iv, p. 321.

Vernacular names. None recorded.

Description. Upper lores and crown to nape velvety-black; forehead white, sometimes running back to the eye at the sides; upper plumage pale pearl-grey, shading to pure white on the rump, upper tail-coverts and tail; first two and rarely three primaries brown, with brown shafts and broad white margins to the inner webs; other primaries and secondaries grey with white internal edges; lower plumage pure white.

Colours of soft parts. Iris dark brown; bill orange-yellow or yellow with a broad black tip; legs and feet orange-yellow.

Measurements. Wing 169 to 183 mm.; tail to end of outer tail-feathers 75 to 95 mm.; culmen 28 to 34 mm., average 30·6 mm.; tarsus about 20 mm.

In Winter the crown is much mixed with white; the upper tail-coverts more grey and the bill becomes blackish and the legs and feet dusky red.

Young birds have the upper plumage with dark bars taking the contour of the feathers; the crown is white speckled with brown and the lores and forehead finely speckled with black; the nape is blackish with the finest white speckles.

Nestling in down. Above pale sandy-brown, mottled with buff, forming three indefinite streaks on the crown and two on the back; underparts white, more buffy on the throat and chin.

Distribution. Temperate Europe, North Africa and Western Asia to Transcaspia and possibly Persia. Wandering in Winter South to Somaliland, the Mekran coast and Sind.

Nidification. The Ternlet breeds in small colonies on sea-coasts, making no nest beyond a scratching in the sand or among pebbles and laying two or three eggs which vary in ground-colour from white to sandy-buff, spotted or speckled with various shades of brown and red-brown with secondary markings of lavender. In shape they are broad obtuse ovals and Jourdain gives the average of one hundred eggs as 32·3 × 23·8 mm.: maxima **36·0** × 23·6 and 33·0 × **25·6** mm.; minima **30·0** × 23·0 and 30·8 × **20·8** mm.

The breeding-season commences on the last ten days of May and continues to the middle of June.

Habits. The Little Tern is a sea-bird, frequenting the coasts of the countries it inhabits. It associates in flocks of about a dozen to twenty pairs, subsisting on small fish, shrimps, mollusca and eels. These it takes as it flies backwards and forwards, hovering for a moment on quickly beating wings and then plunging headlong into the water. It swims but little and when on land seldom runs about but sits and rests before once more taking to wing. Its note is a "jek-ek—jek-ek," whilst over its breeding-ground it constantly utters a call-note sounding like "tiri-iri, tiri-iri."

(2088) Sterna albifrons sinensis.

THE WHITE-SHAFTED TERNLET.

Sterna sinensis Gmelin, Syst. Nat., i, p. 608 (1789) (China); Blanf. & Oates, iv, p. 320 (part.).

Vernacular names. *Muhudu lihiniyā* (Cing.); *Kadal kuruvi* (Tam.).

Description. The White-shafted Ternlet is separated from all the other Ternlets by the very shiny white shaft to the first primary as well as to the others; the bill is nearly as large as that of the European Ternlet but the upper tail-coverts are not always of so pure a white, though never so decided a grey or concolorous with the back as in the other Ternlets.

Colours of soft parts as in the other races.

Measurements. Wing 168 to 183 mm.; culmen 26 to 32 mm.; average 30 mm.

In Winter plumage, young and nestlings differ from the full Summer plumage as in the European Ternlet.

Distribution. The coasts of Ceylon, Burma and China: the Malay States and most of the islands of the Malay Archipelago.

Nidification. This Ternlet breeds on practically all the shores of Southern Asia from Ceylon to extreme East China and probably on the majority of the bigger islands. In China it also follows the courses of big rivers for about 100 miles inland, whilst in Ceylon it breeds on the sandy banks of the big tanks as well as on the sea-shore. No nest is made beyond the usual scratching in the sand. The colonies vary in size from a dozen or so to nearly a hundred, whilst the nesting-hollows are sometimes very close together, sometimes scattered over a considerable area. The eggs number one to three, generally two, the ground-colour varying from a pale buff, creamy-yellow or yellowish-stone to a deep buff or café-au-lait. The markings normally consist of primary blotches and spots of dark brown or reddish-brown with equally numerous secondary blotches of pale grey. These are scattered fairly freely over the whole egg but are more numerous at the larger end. One hundred eggs average 32·2 × 23·8 mm.: maxima 34·1 × 23·7 and 34·0 × 25·5 mm.; minima 29·3 × 23·0 and 31·2 × 22·5 mm. The nesting-season is from June to August in Ceylon and principally in June all over China.

Habits. Over its whole area this Tern is more a coastal form than a river bird, though in China it follows the course of the

Yangtse for nearly 1,000 miles from its mouth. In Ceylon, although it breeds on the sandy shores of the tanks near the sea, it appears to keep almost entirely to the sea for fishing.

(2089) Sterna albifrons pusilla.

THE RIVER-TERNLET.

Sterna pusilla Temm., Man. d'Orn., 2nd ed., iv, p. 464 (1840) (Java).
Sterna minuta. Blanf. & Oates, iv, p. 321 (part.).

Vernacular names. None recorded.

Description. In this little Tern the first primary shaft is light brown, the second darker brown; the upper tail-coverts and tail are almost concolorous with the grey back and the bill is very small.

Colours of soft parts as in the other races.

Measurements. Wing 160 to 175 mm.; culmen 26 to 30 mm.: average 29 mm.; much more slender than in the preceding two races.

Winter and juvenile plumage differ from that of the adult in the same way in all the races. The small bill suffices to distinguish this form from both *S. a. albifrons* and *S. a. sinensis* and its pale brown primary shafts from the black-shafted *S. a. saundersi*.

Distribution. The great rivers of Northern India and Burma, rare in the South of India and *not* extending to Ceylon. In Burma it is found throughout the country on suitable waterways and thence through the Malay Peninsula to the Celebes and Philippines.

Nidification. This Ternlet differs from all others in breeding on rivers only and not on the sea-coast. The rivers selected are, almost without exception, the larger rivers with wide free stretches of sandbanks in their beds. The birds do not breed in large colonies; as a rule some twenty to thirty pairs but, occasionally, as many as two or three hundred may be found together. The nest-scrapings are generally placed very close together, sometimes a dozen nests in three or four square yards. One hundred eggs average 30·9 × 23·2 mm.: maxima **32·9** × 23·0 and 30·8 × **24·4** mm.; minima **28·0** × 23·3 and 31·1 × **21·4** mm. The eggs differ from those of the two preceding races not only in their much smaller size but also in being, as a series, less heavily blotched. The breeding-season is also different, as the young have to be hatched and reared before the Rains break and flood the rivers in which they breed; accordingly, most birds lay in early March and April.

Habits. Except that it keeps to big inland rivers its habits are much the same as those of other Ternlets. Its food consists of small fish, freshwater prawns and small shellfish.

(2090) Sterna albifrons prætermissa.

THE MESPOTAMIAN TERNLET.

Sterna albifrons prætermissa Stuart Baker, Bull. B. O. C., lxix, p. 49 (1928) (Mesopotamia).
Sterna minuta. Blanf. & Oates, iv, p. 321 (part.).

Vernacular names. None recorded.

Description. In this race the shafts of the first two, sometimes three, primaries are dark brown, whilst the rump, upper tail-coverts and tail are grey, almost concolorous with the back; the bill is very slender and small. It is very close to *S. s. pusilla* but the latter has the shaft of the first primary distinctly paler and the rump a paler grey.

Colours of soft parts as in the other races.

Measurements. Wing 160 to 174 mm.; culmen 26 to 28 mm., average 27·0 mm.; very slender.

Distribution. Mesopotamia, the islands of the Persian Gulf and the marshes on the Northern Mekran coast.

Nidification. Ludlow found this little Tern breeding in colonies on the Sonmeani Bheel in June, whilst Pitman found several colonies in Mesopotamia in the Euphrates marshes during the same month. Ticehurst also says that they breed in many places from Tekrit to Fao. Some of the nest-scrapes were made in vegetation growing in the marshy land but others were in the bare mud on the edges of flooded areas. The eggs differ much from those of the other Ternlets in their deep coloration and also in the fact that the ground-colour is frequently very blue-green. They are also decidedly smaller, twenty-eight eggs averaging 31·9 × 23·2 mm.: maxima **33·0 × 24·0** mm.; minima **27·9 × 22·0** mm. Cox also found this little Tern breeding on the islands in the Persian Gulf.

Habits. Apparently this Ternlet is a resident bird, moving locally, according to food conditions, over the greater part of Mesopotamia. In flight, voice etc. it is not distinguishable from the European Ternlet.

(2091) Sterna albifrons saundersi.

THE BLACK-SHAFTED TERNLET.

Sterna saundersi Hume, Str. Feath., v, p. 324 (1877) (Karachi, Sind); Blanf. & Oates, iv, p. 321.

Vernacular names. None recorded.

Description. In this race the upper parts are rather paler than in any of the others and the rump and upper tail-coverts are concolorous with the back and the tail nearly so; the shafts of the first three primaries are black, not white or brown, whilst the outer webs and inside of inner webs are blacker and contrast more strongly with the inner white margin; the bill is shorter and more slender than in either *S. a. albifrons* or *S. a. sinensis*.

Colours of soft parts. Iris brown; bill yellow or orange-yellow with a black tip; legs and feet yellowish-brown.

Measurements. Wing 156 to 170 mm.; culmen 27 to 29 mm., average 27·8 mm.; very slender.

Distribution. Southern coasts of Red Sea and Persian Gulf to the Somali coast in East Africa and Karachi in India.

Nidification. This Ternlet commences to breed in May but the majority do not lay until June, whilst many continue to lay up to the end of August; on the other hand, both Betham and Vidal took eggs at the end of April. The birds breed on the sand-hills and shores from Karachi along the Mekran coast, often some way inland but the nests are so scattered that they can hardly be said to breed in colonies. Here and there ten or a dozen pairs may breed within a radius of half a mile but often one or two nests may be found far from any other. The nest consists of a scratching in the sand and Ticehurst says that a favourite site is a small sand-mound formed by some obstruction plant or other which catches the drift-sand. The normal clutch of eggs is two, sometimes one only and seldom three. The colour is remarkably constant, a pale sandy grey very lightly speckled or spotted with light brown. More boldly marked eggs or eggs with a deeper ground are exceptional and there is no variation in colour like that shown in the eggs of the other Ternlets. Eighty eggs (46 Ticehurst) average 21·7×23·6 mm.: maxima **34·0**×**25·5** mm.; minima **29·5**×23·0 and 32·0×**22·25** mm.

Habits. This bird is entirely a Sea-Tern and is found nowhere inland. It is a resident but moves locally with the supply of small fish and fish fry on which it feeds almost exclusively. Ludlow says that its call, though like that of the other races, is easily recognizable, though the difference is hard to explain.

(2092) Sterna sumatrana sumatrana.

THE BLACK-NAPED TERN.

Sterna sumatrana Raffles, Trans. Linn. Soc., xxii, p. 329 (1877) (Sumatra).
Sterna melanauchen. Blanf. & Oates, iv, p. 322.

Vernacular names. None recorded.

Description. A black line running from the posterior lores, through the eye, round the crown and the back of the nape, including the long crest-feathers; remainder of head white; a collar on the neck pure white, shading into the pale vinous pearl-grey of the upper parts; tail white; first primary dark grey on the outer web, pale grey on the inner web; other quills very pale grey edged white internally; whole lower plumage and crown white, the former flushed with delicate rosy-pink.

Colours of soft parts. Iris brown; bill and feet black, the former with a tiny pale tip to both mandibles, not always present.

Measurements. Wing 220 to 227 mm.; tail 129 to 150 mm.; tarsus 18 to 19 mm.; culmen 31 to 38 mm.

In Winter the ocular and nuchal patch are less wide and defined.

Young birds have the nape dark chocolate-brown; the inner wing-coverts are dark grey-brown and the primaries are dark grey.

Birds in first plumage have the crown brownish and the feathers of the upper plumage with contour-shaped bars of brown.

Distribution. Andamans, coasts and islands of Tenasserim and Malay Peninsula, Sumatra to Celebes; Seychelles and Amirante Islands.

Nidification. The Black-naped Tern breeds principally in June but occasionally in September, perhaps only when the first broods have been destroyed. The sites selected are small rocky islands round the Andamans, Nicobars, the larger islands ot the Mergui Archipelago and the Malay States. The eggs are apparently deposited on the bare rocks with no attempt at a nest and are nearly always two in number, sometimes one only. They cannot, I think, be individually distinguished from the eggs of the Rosy Tern but, as a series, are more boldly marked, more blotched and less speckled. Osmaston took magnificent series of these eggs from various colonies and it is curious that each colony seems to have a regular type: in one the eggs are dark and boldly marked, in another paler and more sandy with feebler markings, whilst a third can be recognized by its deeper ground with not very bold markings, intermediate between the other two. Two hundred eggs average 39·6 × 28·6 mm.: maxima **43·0** × 29·1 and 40·3×**30·0** mm.; minima **34·6**×28·1 and 40·0×**25·9** mm.

The colonies number anything from fifty to two hundred pairs, the eggs being laid very near to one another. The birds are very close sitters and do not rise until the intruder is within a few yards, when they all rise together and circle screaming round his head.

Habits. This is entirely a Sea-Tern, never being found anywhere inland and generally keeping to rocks and quite small islands. It lives almost entirely on fish and small crustacea. Flight and voice are almost identical with those of the Rosy Tern.

Sterna anætheta.

Key to Subspecies.

A. White on tail-feathers very conspicuous ..	*S. a. anaetheta*, p. 141.
B. White on tail-feathers less conspicuous.	
a. Less white on primaries; more white on tail-feathers; wing 236 to 263 mm. ..	*S. a. fuligula*, p. 142.
b. More white on primaries; less white on tail-feathers; wing 218 to 239 mm.....	*S. a. antarctica*, p. 143.

(2093) Sterna anætheta anætheta.

THE PHILIPPINE BROWN-WINGED TERN.

Sterna anaetheta Scopoli, Del Flor. et Faun., Insubr., ii, p. 92 (1786) (Philippines).
Sterna anæstheta. Blanf. & Oates, iv, p. 323 (part.).

Vernacular names. None recorded.

Description. Forehead and short supercilium white; lores, crown, nape and behind the eye black; hind-neck pale grey; edge of wing-coverts white next the back; mantle, tail and wings dark brown; coverts next the white edge to the wing and primaries blackish, the latter with white centres to the inner webs of the first three, very conspicuous and contrasting with the dark brown; outermost tail-feathers white on all but the terminal half of the inner web; sides of head and lower plumage white, sometimes slightly washed with grey on the breast and abdomen and flushe with pale rosy in the breeding-season.

Colours of soft parts. Iris dark brown; bill, legs and feet black.

Measurements. Wings 242 to 261 mm.; tail 156 to 184 mm.; tarsus about 22 to 23 mm.; culmen 41 to 45 mm.

In Winter the upper plumage is less grey, whilst the crown is brown with white edging to the feathers.

Young birds have the upper plumage a paler brown, each feather edged broadly with white; the black band from the lores is replaced with white speckled with black; the crown is brown with greyish edges to the feathers, the nape being almost all brown.

Distribution. Celebes, Philippines and islands off the Chinese coast to the Gulf of Siam and casual round the coast of the Malay Peninsula to Mergui, where, however, the usual form which occurs seems to be *antarctica*.

Nidification. This Brown-winged Tern breeds on many small islands throughout its habitat during May and June. Williamson found a colony breeding on the 6th of May, on a small rocky island, in Chalan, in the Gulf of Siam, the birds laying their single eggs in depressions scratched among the coarse grass which grew everywhere it could obtain root-hold on the upper part of the island. The eggs he obtained are very beautiful and vary greatly. In a series of twenty-four they range from pure pale unspotted blue to deep salmon-buff with bold blotches of blood-red. Others have a pale cream or yellowish ground finely speckled and spotted with light red. The series averages 46·5×32·3 mm.: maxima 47·8×32·5 and 43·5×34·2 mm.; minima 43·5×34·2 and 47·5×31·0 mm.

Habits. The Brown-winged Terns are all strictly Sea-Terns, often being found far away from land and not uncommonly taking a rest on passing ships. Their flight is easy and graceful and they alight on the water more frequently than most Terns. Their food consists of small fish and crustacea, such as are obtained in deep water, except in the breeding-season, when they subsist in great part on shrimps and shallow-water fry. Their call is a rather hoarse "krek."

(2094) Sterna anætheta fuligula.

THE RED SEA BROWN-WINGED TERN.

Sterna fuligula Lich., First Descrip. Anim., footnote, p. 266 (1844) (Red Sea).

Sterna anæstheta. Blanf. & Oates, iv, p. 323 (part.).

Vernacular names. None recorded.

Description. Differs from the preceding form in averaging rather smaller and in having the white on the tail-feathers and wings more extensive and more conspicuous, contrasting more with the adjoining dark brown.

Colours of soft parts as in the other races.

Measurements. Wing 236 to 263 mm.; culmen 45 to 48 mm.

Distribution. Red Sea and Persian Gulf; down the East coast of Africa to Mozambique and down the West coast of India to Bombay.

Nidification. The Red Sea Brown-winged Tern breeds on many of the islands in the Red Sea and Persian Gulf and Harington Bulkley had eggs said to have been taken on an island off the Mekran coast. No nest is made but the single egg is deposited in a hollow scratched by the bird in the ground. Unlike most Terns the site selected is not in the open but either among thin scrubby grass which grows on the upper part of most islands or well concealed among rocks and stones. The eggs vary as much as those of the preceding race but are decidedly smaller. One hundred average 43·8×31·0 mm.: maxima **46·0×33·1** mm.; minima **40·4×28·5** mm. In the Persian Gulf the breeding-season is from the end of May to July and off the Somali coast June and July.

Habits. Those of the species.

(2095) Sterna anætheta antarctica.

The Southern Brown-winged Tern.

Sterna antarctica Lesson, Traité d'Orn., p. 621 (1831) (Isle de France).

Sterna anæstheta. Blanf. & Oates, iv, p. 323 (part.).

Vernacular names. None recorded.

Description. Similar to the preceding race but the white on the primaries is more extensive and more conspicuously pure white, whilst the white on the tail-feathers is less in extent and more sullied with brown.

Colours of soft parts as in the other races.

Measurements. Wing 218 to 239 mm.; culmen 29 to 36 mm.

Birds in Winter plumage and **young** differ in the same way as those of the preceding race.

Distribution. Seychelles, Mauritius, Laccadives, Maldives, Ceylon and the coasts of Malabar.

Nidification. Similar to that of the two preceding species. The eggs cannot be distinguished from theirs and vary in the same way. One is the normal clutch, two being very exceptional. This race breeds within our limits on the Vingorla Rocks in great numbers during the Rains, probably June and July. Hume found on these rocks the remains of many birds and eggs but no one since has visited this place at the proper season, so their breeding has never yet been witnessed. Hume's eggs averaged about 43·2×30·1 mm. This Tern also probably breeds both on the Maldives and Laccadives.

Habits. Those of the species.

Sterna fuscata.

Sterna fuscata Linn., Syst. Nat., 12th ed., i, p. 228 (1766).

Type-locality: San Domingo, West Indies.

The typical form is less grey underneath than our Indian bird and has a rather smaller bill. The differences are but slight.

(2096) Sterna fuscata infuscata.

The Indian Sooty Tern.

Sterna infuscata Lichten., Verz. doubl. Mus. Berlin, p. 81 (1823) (East Indies).
Sterna fuliginosa. Blanf. & Oates, iv, p. 324.

Vernacular names. None recorded.

Description. Forehead, running back in an angle over the eye, white; a line from the gape to the eye, crown and nape black; hind-neck mixed black and white; upper plumage deep chocolate-brown; outermost tail-feathers greyish-white, darker at the tip and at the end of the inner web; primaries with the inner webs paler on the outer halves; lower plumage, axillaries and under wing-coverts white.

Colours of soft parts. Iris dark brown; bill and feet black.

Measurements. Wing 278 to 297 mm.; tail 145 to 162 mm.; tarsus about 23 to 24 mm.; culmen 35 to 42 mm.

In non-breeding plumage the crown and lores are streaked with white.

Young birds are paler above than the adult and are pale sooty-brown below; the feathers of the head and to a less extent the back are margined with paler rufous-white; scapulars and innermost secondaries with broader, whiter tips.

Nestling in down. Upper parts greyish-white; lower surface white.

Distribution. Coasts of India and Burma, Andamans, Ceylon, Laccadives, Maldives, Mauritius and Seychelles. I obtained a specimen of this Tern in Cachar, some hundreds of miles from the sea, after a series of heavy storms.

Nidification. Owston found this bird breeding in great numbers in the Riu-kiu Islands in April 1898, laying one, two or three eggs on the bare rocks with no pretence at a nest or attempt at concealment. The colony was a large one of some hundreds of pairs and the nests were very close together. In the Seychelles they usually lay but one egg and this seems to be the normal number with the other races but in the Laccadives Hume found two or three eggs or young in nearly all the nests. The eggs vary from pure white, or white tinged with yellow, pink, olive or brown to deep salmon or reddish-buff, sparingly blotched with dark brown or reddish-brown. Thirty eggs average 52·3 × 36·0 mm.: maxima 58·0 × 37·0 and 54·3 × 38·1 mm.; minima 47·5 × 35·1 and 51·1 × 34·7 mm.

In the Laccadives Hume found that many young were nearly fledged by February and in these reefs the birds must begin to lay about Christmas,

Habits. The Sooty Tern is essentially an oceanic bird, often being found at great distances from any land. They feed on small fish and crustacea and during the breeding-season feed their young almost entirely with small cephalapods of the genus *Sepida*. They swim well and frequently alight and rest on the water.

Genus **ANOUS**.

Anous Stephens, in Shaw's Gen. Zool., xiii, pl. i, p. 139 (Feb. 1826).

Type by orig. desig., *A. niger* Stephens = *Sterna stolidus* Linn.

The genus *Anous* differs from *Sterna* in having the third or fourth pair of tail-feathers longest, not the outermost.

The bill is long, slender and considerably curved towards the end of the culmen; the nostrils are situated in a groove and are still further from the base than in *Sterna*; the tarsus is very short, much shorter than the middle toe without claw; the feet are large with fully-webbed toes; the wing is long with the first primary longest.

Two species are found within Indian limits which are sometimes divided into two genera, *Anous* and *Micranous*, but the differences seem more specific than generic and I retain them both in *Anous*. The genus is represented throughout the Tropical and Subtropical seas.

Key to Species.

A. Wing over 270 mm.; crown grey; fourth pair of tail-feathers longest	*A. stolidus*, p. 145.
B. Wing under 240 mm.; crown white; third pair of tail-feathers longest	*A. minutus*, p. 147.

Anous stolidus.

Sterna stolida Linn., Syst. Nat., 10th ed., i, p. 13 (1758).

Type-locality: Barbados.

The typical form differs from that which visits India in the proportions of the tail and in other details.

(2097) Anous stolidus pileatus.

THE PHILIPPINE NODDY.

Sterna pileata Scopoli, del Flor. et Faun., Insubr., ii, p. 92 (1786) (Philippines).
Anous stolidus. Blanf. & Oates, iv, p. 325.

Vernacular names. None recorded.

Description. Forehead pure white, passing into grey on the crown, brownish-grey on the neck and finally into chocolate-brown on the upper plumage; outer webs of primaries and the tail blackish-brown; lores next the eye and round the upper half of the eye black; below the eye whitish; lower cheeks chocolate-brown.

Colours of soft parts. Iris brown; bill, legs and feet black or blackish-brown.

Measurements. Wing 271 to 300 mm.; tail 152 to 176 mm.; tarsus about 24 to 25 mm.; culmen 35 to 42 mm.

Young birds are a rather paler brown and have no grey cap.

Nestling in down. Sooty-brown above and on the throat and breast, paling to sooty-white on the abdomen.

Distribution. Japanese Islands, Philippines to Laccadives, the Burmese coasts, Nicobars etc.

Nidification. Within our limits the only record of these birds breeding is that of Hume, who found it in immense flocks on the Cheebaniani Reef of the Laccadives in February. The birds had then just commenced laying and Hume obtained eight eggs which he describes as being like those of *Sterna fuscata* but *more* brightly coloured. Sir W. J. F. Williamson obtained a fine series on one of the small islands in the Gulf of Siam and these, laid in May, are like all other Noddy's eggs much *less* richly marked than those of the Sooty Terns. The ground is white, sometimes faintly tinged with grey, stone-colour, greenish or pink but in none at all rich or deep. The markings generally consist of sparse blotches and spots of dark reddish-brown with secondary markings of lavender-grey. The blotches are generally more numerous at the larger end and in a few eggs are comparatively bold and handsome. Only one egg is laid on the bare rocks, with no nest, quite in the open. Twenty-seven eggs average 51·8×35·8 mm.: maxima 55·2×35·0 and 53·1×37·2 mm.; minima 49·5×34·8 mm.

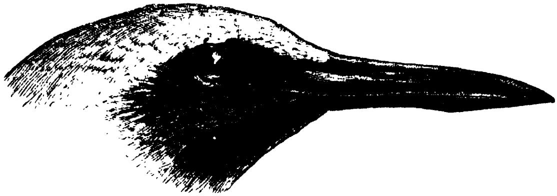

Fig. 25. Head of *A. s. tenuirostris*. ¾.

Habits. The Noddies are oceanic birds, only frequenting land regularly during the breeding-season and then selecting, for the most part, rocky reefs and small islands or the wilder more broken areas on the large islands. Their flight is in appearance much slower and more lethargic than those of the Terns; they wheel about more lazily, seldom, if ever, hover and then plunge after their fish prey, but settle on the sea, feeding on small surface mollusca, dead fish and floating oddments. During the breeding-season they and their young feed entirely on the small *Sepida* cephalapods which form the food of the Sooty Terns.

Anous minutus.

Anous minutus Boie, Isis, p. 188 (1884).

Type-locality: N.E. Australia.

Three specimens of a small Noddy have been obtained within Indian limits, one at Minicoy, one near Calcutta and one in the Bay of Bengal. All three of these are very dark birds with very long slender bills, which, with the difference in the white caps, at once separate them from *tenuirostris* but at the same time they are long in the wing for typical *minutus*. The grey of the head is confined to the crown and does not extend to the nape. It is difficult to place these specimens and probably, if their breeding-place could be found, they would prove to be another new race. Provisionally I place them under the name *A. minutus worcesteri*, of which the type-locality is the Philippines.

This species has been separated by Mathews generically as *Megalopterus*. There seems to be no reason to adopt the genus for the purposes of this work and I retain it under *Anous*.

(2098) Anous minutus worcesteri.

THE PHILIPPINE WHITE-CAPPED NODDY.

Micranous worcesteri McGregor, Phil. Journ. Sci., Sec. D, vol. vi, p. 185 (1911) (Cavalli, Sulu Bay).
Anous leucocapillus. Blanf. & Oates, iv, p. 326.

Vernacular names. None recorded.

Description. Forehead white, shading into grey on the anterior crown and nape; feathers round the front of the eye black and round the back white; remainder of plumage very dark chocolate-brown, the lores and chin almost black.

Colours of soft parts. Iris brown; bill black; legs and feet brownish-black.

Measurements. Wing 227 to 234 mm.; tail 115 to 122 mm.; tarsus 20 to 21 mm.; culmen 46 to 49 mm.

Young birds are a lighter brown but have the white cap, perhaps less extended on the nape, and black lores at all ages.

Distribution. Philippines, throughout the Malay Archipelago. There is one specimen in the British Museum from Calcutta, another obtained in the Bay of Bengal near the mouth of the Ganges and a third at Minicoy.

Genus GYGIS.

Gygis Wagler, Isis, 1832, p. 1223.

Type by mon., *Gygis alba* Sparrm.

In this genus the bill is stout and longer than the head, the culmen straight, with the nostril placed nearer the base than the tip; the wings are long, with the first primary longest, the tail moderate, less than half the wing in length; the tarsus very short; the toes long and the webs slightly indented. The plumage is white.

Gygis alba.

Sterna alba Sparrm., Mus. Carl., i, No. 2 (1786).

Type-locality by sub. desig.: Ascension Is.

The typical form differs from the Indian Ocean form in having white shafts to the primary quills and tail-feathers instead of dark brown.

(2099) Gygis alba monte.

THE INDIAN OCEAN WHITE TERN.

Gygis alba monte Mathews, Birds of Australia, ii, p. 443 (Nov. 1st, 1912) (Seychelles).
Gygis candida. Blanf. & Oates, iv, footnote, p. 326.

Vernacular names. None recorded.

Description. A narrow ring of feathers round the eye black; remainder of plumage pure white; shafts of primaries and tail-feathers dark brown.

Colours of soft parts. Iris brown; bill black, the basal half blue; the legs and feet yellow.

Measurements. Wing 223 to 239 mm.; tail 105 to 111 mm.; tarsus 11 to 12 mm.; culmen 36 to 40 mm.

Nestling in down. Black.

Distribution. Indian Ocean, breeding in the Seychelles.

Nidification. The White Tern breeds in the Seychelles during November, laying a single egg which is deposited on a branch of a tree. There is no nest but the egg is placed either in some small hollow or ledge of a branch or on the lichen and moss with which it may be covered. Nor is an absolutely horizontal branch always selected and, so long as the egg will stay where laid, almost any spot seems good enough, at any height from ten to sixty feet. The parent birds, both sexes, sit very close, refusing to move off their eggs until almost touched and if there is any wind are still more loth to leave. The young ones remain on the branches until fledged, looking like black balls of fluff as big as their snow-white parents. The eggs are quite unlike those of any other Gull or Tern. In shape they are very broad ellipses, whilst the ground-colour varies from almost dead grey-white to very pale greyish-pink, buff or dull yellow. The markings vary considerably. The primary ones consist of blotches, scriggly lines or spots of black, or some shade of reddish-brown with secondary blotches and spots of grey. The markings of both kinds are distributed freely over the whole egg but in many are more numerous at one end, in a few cases forming ill-defined caps or rings. Forty eggs average 40·2 × 30·7 mm.: maxima **44·5** × 31·1 and 42·0 × **32·1** mm.; minima **35·9** × 29·3 and 39·7 × **28·1** mm.

Habits. Similar to those of the Noddies, but faster, lighter and more elegant on the wing.

A specimen of this bird obtained in the Bay of Bengal is in the Leyden Museum. Hume thinks he twice saw this species in Indian Seas, whilst in 1897, when on my way home to England, a White Tern twice came about our steamer between Madras and Colombo.

Family RHYNCOPIDÆ.

Both mandibles greatly compressed, the lower much longer than the upper, both convex on the sides towards the base; in the nestling when first hatched the bill is like that of a young Tern.

Genus RHYNCOPS.

Rhyncops Linn., Syst. Nat., 10th ed., i, p. 138 (1758).

Type by mon., *Rhyncops nigra* Linn.

In *Rhyncops* the culmen is curved; the lower mandible is so much compressed that it looks like a thin flexible knife with a truncated end and with minute oblique ridges on the sides; the nostrils are long and are placed in an irregular hollow close to the commissure at the base; the wings are very long, with the first quill longest; the tail is short and slightly forked; the tarsus is longer than the middle toe and claw, the feet small and the webs with concave edges between the toes.

The genus is represented in America, Africa and India.

(2100) Rhyncops albicollis.

THE INDIAN SKIMMER.

Rhyncops albicollis Swains., An. in Menag., p. 300 (1838) (India); Blanf. & Oates, iv, p. 327.

Vernacular names. *Panchira* (Hind.).

Description. Forehead, face, cheeks, a broad collar and all the lower plumage white; crown, nape, back and wings dark brown; primaries blackish, with a paler wedge on the inner webs of all but the first; a broad wing-bar formed by the tips of the greater coverts and secondaries; some of the scapulars also edged white; centre of rump and upper tail-coverts mottled brown and white; sides of rump and upper tail-coverts and the tail white.

Colours of soft parts. Iris brown; bill orange-red, yellow at the tip and more red at the base; legs and feet bright vermilion.

Measurements. Wing 344 to 398 mm.; tail 104 to 112 mm.; tarsus 24 to 26 mm.; culmen 58 to 75 mm.; lower mandible 78 to 100 mm.

Young birds have the brown of the upper parts a lighter brown, each feather edged with fulvous-white; the tail is mottled with white near the tip.

Distribution. The larger rivers of India and Burma, rare in the South and not known in Ceylon.

Nidification. The Skimmers breed during March, April and early May on all the larger rivers, whilst in Assam I have known them to breed as early as February. They breed in colonies, often of considerable size, laying their eggs in hollows scratched out by themselves on the bare sand of sand-banks in the rivers. The nests are placed close together but generally apart from the Terns and other birds, which frequently breed on the same banks. In the North-West of India four seems to be the normal clutch but farther East three is more often found, whilst in Assam and Burma twos and threes form the full clutch. The eggs are very Tern-like but have a character of their own which is hard to describe. They are handsome eggs with a ground of pale cream, yellow-stone, olive or buff, sometimes quite a warm tint, marked with blotches of dark brown or reddish-brown and even more numerous secondary ones of neutral tint. Sometimes the primary marks take the form of scrolls and often have a curious spiral effect. Sixty eggs average 41·0×29·9 mm.: maxima 44·2×31·0 and 42·9×32·0 mm.; minima 37·4×31·0 and 43·1×28·0 mm. The parent birds do not sit as close as Terns do, nor do they become so excited and noisy as these birds when their nests are being robbed.

Habits. The Indian Skimmers keep almost entirely to wide rivers, on which they fly up and down close to the surface of the water, their knife-shaped lower bill just catching the surface of the water as they fly. They feed on tiny surface crustacea and very small fish fry but as a rule the stomachs of those examined held nothing but a thick oily fluid. Some examined by myself had tiny freshwater shrimps and "sand-hoppers" and these birds, which were busy feeding young in May, were skimming along the extreme edge of the water, very slowly, their bill-tips submerged and, possibly, cutting through the surface of the sand and so disturbing their prey. Whether this was so or not it was, however, impossible to see. They occasionally frequent the edges of marshes and lakes for feeding purposes. Their normal flight is slow and leisurely, with steady flapping of the wings, but they can go at immense speed when frightened. Their note is a shrill, chattering scream.

Suborder LIMICOLÆ.

In this suborder Lowe places all those groups of *Charadriiformes* in which the basipterygoid processes persist in the adult.

The suborder he divides into two families, the *Charadriidæ* and the *Scolopacidæ*.

Key to Families.

A. Nasal groove not extending more than half the length of the upper mandible; tarsus reticulated behind and frequently in front also	**Charadriidæ**, p. 152.
B. Nasal groove extending along greater part of upper mandible; tarsus shielded in front	**Scolopacidæ**, p. 199.

Family CHARADRIIDÆ.

In this family the skulls are schizorhinal, nostrils pervious; basipyterygoid processes present; cervical vertebræ fifteen; hind toe absent or very small. Lowe originally divided his *Charadriidæ* into six subfamilies. Of these, two, the *Jacaninæ* and *Rostratulæ*, have since been shown to be more nearly Ralline and have been removed accordingly. Of the other four the *Vanellinæ* and *Lobivanellinæ* cannot, with our present knowledge, be separated and Lowe would, for the time being, re-unite them. This therefore leaves his three principal subfamilies, which may be diagnosed as follows.

Key to Subfamilies.

A. Lacrymals free	*Pre-Charadriinæ*, p. 153.
B. Lacrymals not free.	
a. Supraorbital rim conspicuously raised, everted or corniced	*Charadriinæ*, p. 167.
b. Supraorbital rim not conspicuously raised, everted or corniced	*Vanellinæ*, p. 179.

Subfamily PRE-CHARADRIINÆ.

In this subfamily the lacrymals are free but have prominent outjutting processes and are not rounded and merged in the line of the orbital rim as in the *Charadriinæ*. There is no foramen for the passage of the nasal duct.

The subfamily contains five genera represented within our limits, the species of which cover practically the whole world. Since the first edition of the 'Avifauna of British India' was written, there is no other group of birds in which so many drastic changes have been made in classification and in the splitting-up of genera. This splitting-up has now been admitted by most systematists to be necessary and it is accordingly accepted by me. *Squatarola* and *Pluvialis* have been shown by Lowe to be not only different genera but to be members of different groups, whilst the genus *Charadrius*, which formerly contained all those little Plovers of the Ringed Plover and Kentish Plover types, has been divided into no fewer than five genera, although, superficially, they appeared to be so closely allied.

Key to Genera.

A. Bill moderate, not longer than head; tarsus reticulated behind.	
a. Bill conical, culmen flattened, no swelling at tip	ARENARIA, p. 153.
b. Upper mandible swollen near tip.	
a'. A hind toe	SQUATAROLA, p. 156.
b'. No hind toe.	
a^2. No white ring round neck	EUPODA, p. 158.
b^2. A white ring round neck	LEUCOPOLIUS, p. 160.
B. Bill long; tarsus reticulated throughout	HÆMATOPUS, p. 164.

Genus **ARENARIA.**

Arenaria Brisson, Ornith., i, p. 48, v. p. 132 (1760).

Type by taut., *Tringa interpres* Linn.

The bill in this genus at once distinguishes it from all other genera. It is conical and pointed with the culmen nearly straight; the linear nostril is situated in a groove which extends nearly half-way down the bill; the wings are long and pointed, the first primary longest; the tarsus is short, reticulated behind and scutellated in front; the hind toe is well developed; there is no web between the anterior toes.

Under the rulings of the Ornithological Congress the name *Arenaria* of 1760, which antedates *Strepsilas* of 1811, must be accepted, in spite of its being a generic term in botany.

The genus is found over practically the whole Northern half of the Continents of Europe and Asia, being found far South in the non-breeding season.

(2101) Arenaria interpres interpres.

THE TURNSTONE.

Tringa interpres Linn., Syst. Nat., i, p. 148 (1758) (Sweden).
Strepsilas interpres. Blanf. & Oates, iv, p. 222.

Vernacular names. None recorded.

Description.—Breeding plumage. Extreme point of forehead black, running back to the eye and thence round over the anterior ear-coverts and cheeks to meet another black line from the base of the lower mandible; this black then extends down the sides of the neck to meet the black breast and fore-neck, and runs up the sides of the neck to form a demi-collar; face white; crown, nape, hind-neck and posterior sides of neck pure white, the crown and nape streaked with black and a black patch on each side of the nape; upper back black, the centre rufous streaked with black; scapulars rufous and black with small white edges; lower back white, rump and shorter upper tail-coverts black; longer tail-coverts white; central tail-feathers black with broad white bases; outermost white with a broad subapical band of black, intermediate feathers grading from one to another; wing-coverts brown edged paler and the inner slightly splashed with rufous; the least coverts next the scapulars brown, with broad white edges; primaries brown, the inner webs edged with white; shafts white; outer secondaries white with brown subterminal patches; inner secondaries barred black and rufous; a patch of chestnut under the wing next the breast; remainder of underparts white.

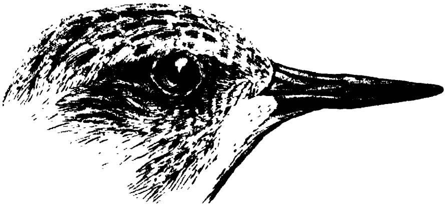

Fig. 26.—Head of *A. i. interpres*. $\frac{1}{1}$.

Colours of soft parts. Iris brown; bill black; legs and feet orange-red; claws black.

Measurements. Wing 143 to 155 mm.; tail 76 to 79 mm.; tarsus about 24 to 27 mm.; culmen 20 to 23 mm.

In non-breeding plumage. The upper plumage is dark brown, each feather edged paler; the scapulars have concealed white bases; lower back, rump and tail as in breeding plumage; wing-coverts brown, the least and the primary coverts broadly tipped with white; fore-neck and sides of breast brown, the feathers with pale edges; a ring round the eye white; sides of head and neck brown more or less streaked with white; chin, throat, centre of breast and remainder of lower plumage white.

Nestling in down. Upper plumage pale fulvous, much mottled with black; the crown more golden-fulvous, with the marks forming a well-defined central and two lateral streaks; on the lower back also three fairly well-defined streaks can be discerned; a band across the fore-neck dusky; rest of lower plumage white.

Young in first plumage blackish-brown above with rufous edging to each feather.

Distribution. Breeding in Subarctic Europe and Western Asia and in Winter South to the Canaries, North Africa, India, Burma, Malaya, and Sumatra. Within Indian limits it is extremely common in the North of India and Burma, generally on the coast-lines, as far South as Bombay and the Laccadives, and it has also occurred in Ceylon. There are specimens from Malacca in full breeding-dress and it occurs as far East as Annam.

Nidification. The Turnstone breeds from Greenland to Eastern Siberia as far South as the Southern islands of the Baltic. It is very partial to quite small islands, occasionally two pairs sharing the same island. The eggs, three or four, are laid in depressions scratched in the sand or shingle, as a rule with no lining, sometimes with a few bents or scraps of moss. In the North the site selected is quite in the open but in the South it occasionally chooses a spot protected by a tuft of grass or something similar. The eggs are distinctive; rather long eggs for Waders, generally a decidedly olive-tinged ground-colour with rather light brownish primary and pale grey or livid secondary markings, these often rather spiral in character. Jourdain gives the average of one hundred eggs as 40·5 × 29·2 mm.: maxima **44·5** × 30·4 and 43·2 × **31·3** mm.; minima **36·0** × 28·2 and 40·5 × **26·0** mm.

In the South most eggs are laid between the 20th of May and the 10th of June but in the North about a month later.

Habits. The Turnstone keeps entirely to the sea-coast, where it feeds, just above the tide, on small crustacea, molluscs and worms, hunting for them under the stones and heavy shells, which it turns over with its bill. It is an active little bird, running in little bursts here and there, its head tucked well in and held low. It flies fast, wheeling with great speed and is generally found in small parties of a dozen to thirty or forty. When migrating in

October and again in April it may occasionally be found inland but this is exceptional. Messrs. Moore and Monday shot three, two in full breeding plumage, in Dibrugarh, flying North on April the 9th.

Genus **SQUATAROLA**.

Squatarola Cuvier, Règne Anim., i, p. 497 (1816).

Type by taut., *Tringa squatarola* Linn.

In the genus *Squatarola* there is present a small hind toe and claw; the bill is straight, stout and about as long as the head; the nostrils linear and placed fairly close to the base of the bill in a rather deep, broad groove; the wing is long and pointed and the first primary longest; the tail is short and rounded; the tarsus is covered with hexagonal scales; outer and middle toes connected by a small web at the base. The genus is almost cosmopolitan.

Squatarola squatarola.

Key to Subspecies.

A. Rather more brown, less grey. Slightly larger	*S. s. squatarola*, p. 156.
B. Rather more grey, less brown. Slightly smaller	*S. s. hypomela*, p. 157.

The differences between the two races is very slight and perhaps hardly worth recognizing subspecifically. In Winter plumage, however, the colour of the upper parts in the Eastern birds certainly seems more grey.

(2102) Squatarola squatarola squatarola.

THE WESTERN GREY PLOVER.

Tringa squatarola Linn., Syst. Nat., 10th ed., i, p. 149 (1758) (Sweden).
Squatarola helvetica. Blanf. & Oates, iv, p. 236 (part.).

Vernacular names. *Barra batan* (Hind.).

Description.—Breeding plumage. Upper plumage a pearly-grey, banded everywhere with black, the long scapulars being paler brown with blackish bars and white indentations; primaries blackish-brown with long wedge-shaped marks on the inner webs; outer secondaries with white bases; extreme forehead, round the eyes, sides of the head and lower plumage to vent black; under wing-coverts, thighs, vent and under tail-coverts white; axillaries black and white.

Colours of soft parts. Iris dark brown; bill black; legs and feet dusky grey.

Measurements. Wing 189 to 201 mm.; tail 73 to 83 mm.; tarsus 45 to 51 mm.; culmen 28·0 to 30·5 mm. (*Hartert*).

In non-breeding plumage the forehead and lores are white, speckled with black; rump and npper tail-coverts white with narrow bars of brown; remaining upper plumage dark brown, each feather edged paler; scapulars and wing-coverts with broader white tips and semi-bars; sides of head and neck white streaked with brown; breast and flanks white, lightly barred with pale brown; remainder of lower parts white.

Distribution. Greenland, Eastern North America, Arctic Europe to East Siberia, migrating South in Winter to the coasts of Southern Europe, Africa to the extreme South, Madagascar, Seychelles and to North-West India. Records from Eastern India, Burma and Ceylon all appear to refer to the next race.

Nidification. The Grey Plover breeds in the tundras of the Arctic region, laying four eggs in a depression in the moss, lined with scraps of moss and lichen, during late June and early July. Typically the eggs are like rather pale, long, large eggs of the Golden Plover; the ground-colour varies from pale stone or olive-grey to buff, profusely marked with reddish-black and black blotches, usually more numerous at the larger end. The secondary marks of grey are less numerous. Jourdain gives the average of forty eggs as 51·6 × 35·9 mm.: maximum **55·2** × 35·6 and 50·7 × **38·0** mm.; minima **45·7** × 39·7 and 51·9 × **34·0** mm.

Habits. This Plover visits India in flocks of some size from October to March but is more common in the coastal districts than inland. It is a shy, wild bird and very difficult to approach within shot, whilst its shrill pipe gives the alarm to every other bird as well. The speed at which it flies, its wariness and its excellence on the table give it high rank as a sporting bird. It feeds on worms, crustacea, molluscs, insects, grasshoppers and, it is said, on seeds also.

(2103) Squatarola squatarola hypomela.

THE EASTERN GREY PLOVER.

Charadrius hypomelus Pallas, Reise Russ. Reichs., iii, p. 699 (1776) (East Siberia).
Squatarola helvetica. Blanf. & Oates, iv, p. 236 (part.).

Vernacular names. *Barra batan* (Hind.).

Description. A slightly smaller bird and distinctly more grey, less brown in the non-breeding plumage.

Colours of soft parts as in the typical form.

Measurements. Wing 175 to 193 mm.

Distribution. Eastern Siberia to Japan. In Winter South to Australia, Tasmania, South China and Burma. The Assamese birds seem to be of this race and they almost certainly occur in Eastern Bengal.

Nidification. Nothing recorded.

Habits. Similar to those of the preceding bird. I found this race common in Assam, migrating South in the last few days of September and North at the end of March and early April. In most instances they were in small flocks of ten to twenty birds but on one occasion I shot a male in full breeding plumage from a flock of many hundreds, all apparently of this species. They were feeding in a ploughed field and rose a good hundred yards in front of my companion, whistling shrilly, but wheeled and gave me a long shot in so doing. This bird's stomach was full of a small black and very hard beetle.

Genus **EUPODA**.

Eupoda Brandt, Voy. Sci. Altai Orient., p. 444 (1845).
Eupodella Mathews, Birds of Australia, iii, pt. 1, p. 83 (1913).

Type by orig. desig., *Charadrius asiaticus* Pall.*

This genus differs from *Leucopolius* in having a smaller, more slender bill and in having no white ring round the neck, though there are traces of a pale hind-neck sometimes in *E. vereda*. Proportionately to its size it has much longer legs than either *Leuocpolius* or *Charadrius*. From *Cirrepedesmus* it differs markedly in its slender bill and much less swollen dertrum.

Key to Species.

A. Smaller; wing under 152 mm.; axillaries white	*E. asiatica*, p. 158.
B. Larger; wing over 152 mm.; axillaries light brown	*E. vereda*, p. 159.

(2104) Eupoda asiatica.

THE CASPIAN SAND-PLOVER.

Charadrius asiaticus Pall., Reise Russ. Reichs., ii, p. 715 (1773) (South Tartary Steppes).
Ægialitis asiatica. Blanf. & Oates, iv, p. 239.

Vernacular names. None recorded.

Description. Forehead, fore-crown, lores and supercilium white; posterior crown to nape, hind-neck and upper parts brown; the primary coverts and primaries blackish-brown; the first primary with a white shaft, the second with the shaft whitish near the tip; tail brown, with subterminal blackish band and white tip, the outermost feathers also edged pale whitish-brown; round the front of the eye brown, extending as a streak through the upper ear-coverts; rest of face, chin, throat and fore-neck white; upper breast chestnut, followed by a black band on the lower breast; flanks, abdomen, axillaries and under tail-coverts white; under wing-coverts grey-brown and white, the greater coverts all brown.

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* As Mathews's name *Eupodella* is merely a new name in place of the generic name *Eupoda*, the type for it must therefore be the same as for that bird, *i. e.*, *Charadrius asiaticus* Gould.

Colours of soft parts. Iris brown; bill black; legs and feet dusky olive.

Measurements. Wing 141 to 151 mm.; tail 51 to 59 mm.; tarsus about 40 to 42 mm.; culmen 20 to 21·5 mm.

In non-breeding plumage the breast is grey-brown.

Young birds have narrow fulvous edges to the plumage of the upper parts.

Distribution. From the Caspian Sea to Altai, Turkestan and probably the greater part of the high Central Asian plateau. One specimen was obtained by Vidal in the Bombay Presidency near Ratnagiri, whilst in Winter it is found in East and South Africa as far as Cape Colony. Swinhoe obtained it in North China.

Nidification. Buturlin and Sushkin say that it breeds in the Volga district Northwards and in the Turgai Government. The nest is merely a depression scratched in sand or among pebbles on the shores of lakes and big rivers, or in desert wastes. The eggs, three or four in number, are like those of *Charadrius hiaticula*, "ochreous-brown, boldly spotted and blotched with blackish." One sent to Dresser measured 36·8 × 27·2 mm. The principal breeding month is May.

Habits. This Plover, which seems rare everywhere, does not collect in flocks but may be met with singly or in pairs both on the sea-coasts and on the shores of big rivers and lakes as well as on desert plains and uplands some distance from water. Its note is a plaintive treble whistle.

(2105) Eupoda vereda.

THE EASTERN SAND-PLOVER.

Charadrius veredus Gould, P. Z. S., 1848, p. 38 (N.W. Australia).
Ægialitis vereda. Blanf. & Oates, iv, p. 240.

Vernacular names. None recorded.

Description. Similar to the preceding bird but with much more white on the fore-crown and forehead, no brown in front of the eye or over the ear-coverts and, sometimes, a pale whitish-brown or white hind-neck; the axillaries are light brown tipped with white; the white upper plumage, especially the head, is a paler brown; the black breast-band is wider.

Colours of soft parts. Iris hazel; "bill olive-brown; legs pale brownish flesh-colour; feet washed with grey, blackish on joints" (*Swinhoe*).

Measurements. Wing 153 to 167 mm.; tail 59 to 64 mm.; tarsus about 44 to 46 mm.; culmen 22 to 24 mm.

Distribution. Northern China and Mongolia. In Winter South through China to Australia and the Philippines. A single specimen was shot by Dr. G. E. Adams in the Andamans in 1872 and identified by Ball.

Nidification. A single egg sent me with portions of the skin of the bird shot off the nest is more like a weakly-marked Dotterel's egg than that of *Ægialitis*, as might have been expected. It measures 38·4 × 27·0 mm. and was taken about the 2nd of June, 1906, in Ladak, West Tibet, at an elevation of about 12,500 feet.

Habits. Those of the genus.

Genus **LEUCOPOLIUS.**

Leucopolius Bonap., Comp. Rend., xliii, p. 417 (1850).

Type by taut., *Ægialitis marginata* Vieill.

This genus has hitherto been generally united with *Charadrius* (*Ægialitis* auct.), of which *hiaticola* is the type. It differs, however, from the birds of that group, according to Lowe, in having the lacrymals free and presenting outward projecting processes like the Gulls; there is no foramen for the nasal duct, its place being taken by a groove.

In *Leucopolius* most of the characters, except the important ones mentioned above, are also those of *Charadrius*. The bill is small and practically straight; the tarsus fairly long and reticulated throughout; there is no hind toe.

Key to Species.

A. White band on hind-neck not divided from back by black band .... *L. alexandrinus*, p. 160.
B. White band on hind-neck separated from back by a black band.................. *L. peronii*, p. 164.

Leucopolius alexandrinus.

Key to Subspecies.

A. Upper parts with no trace of rufous in breeding plumage; culmen 13 to 15 mm.
  a. Wing 106 to 114 .... *L. a. alexandrinus*, p. 161.
  b. Wing 93 to 107 .... *L. a. seebohmi*, p. 162.
B. Upper plumage suffused with rufous; culmen 17 to 19 mm................ *L. a. dealbatus*, p. 163.

(2106) Leucopolius alexandrinus alexandrinus.

THE KENTISH PLOVER.

Charadrius alexandrinus Linn., Syst. Nat., 10th ed., i, p. 150 (1758) (Egypt).
Ægialitis alexandrina. Blanf. & Oates, iv, p. 240 (part.).

Vernacular names. *Punchi-olēyiyā* (Cing.); *Sinna-kōtān* (Tam.).

Description. Forehead white, followed by a broad black patch; above and behind the eye white; lores black, running back under the eye and in a streak behind; anterior crown, nape and hindneck rufous, more grey on the nape; whole remaining upper plumage sandy grey-brown, the four middle tail-feathers blackish, the outermost white throughout and the intermediate white on the outer webs and tips, blackish elsewhere; primaries blackish, the first white-shafted throughout, the others increasingly brown at their bases; innermost secondaries like the back, outer blackish-brown with white tips and edges; median, greater and primary coverts blackish with white tips forming wing-bars; a broad black patch on each side of the breast, remainder of lower plumage white.

Colours of soft parts. Iris brown; bill black; legs and feet plumbeous-grey.

Measurements. Wing 106 to 114 mm. (one 118); tail 48 to 50 mm.; tarsus 27 to 29 mm.; culmen 13 to 15 mm. (one 16 mm.).

In Winter the rufous and black crown is lost, these parts assuming the colour of the back; the white forehead is restricted in extent and the black eye-streak is replaced by grey-brown.

Female similar to the male in Winter but with less white on the forehead; the lores, ear-coverts and eye-streak are sandy-brown and the breast-patches brown. In Summer when freshly moulted the edges of the feathers of the crown, as well as those of the brown breast-patches, have rufescent edges.

Young birds are like the female but have nearly all the feathers of the upper part fringed with sandy-buff.

Nestling in down. Forehead, a ring round the back of the neck and the lower parts white; an ill-defined eye-streak dark brown and sometimes faint indications of a black edging to the crown; a dark brown horse-shoe mark on the wings; upper plumage and crown pale buffy-grey speckled with brownish.

Distribution. Breeding in Europe and Western Asia to Mesopotamia and Sind. Several specimens in the British Museum collection from Khandesh in Bombay with wings 106 to 111 mm. and culmens over 15 mm. are in my opinion also of this race and not *seebohmi* as noted on their data labels.

Nidification. The Kentish Plover breeds numerously in Sind and as far South as Guzerat in Cutch. The breeding-season seems to be a very long one. Cumming found young hatched on the 9th of March, whilst Bulkley took eggs as late as August. Most eggs are laid in April and May but probably many birds have two broods. The nest is the usual scrape, lined with scraps of shell, bits of dead leaves or, when these are available, tiny pebbles. The scrape may be made on the bare sand or mud near creeks and marshes or some distance away from them. Ticehurst says a favourite site is the top of one of the little wind-blown mounds which pile round the Sueda bushes. The number of eggs laid seems to be nearly always three but Ticehurst found some of the early clutches to contain four. In shape they are conical oval, the ground-colour varying from pale yellowish or greyish-stone to an olive or buffy-brown, whilst the marks consist of small blotches, specks and scrawls of black or blackish-brown, generally most numerous at the larger end. In most eggs there are a few secondary markings of pale grey but they are very inconspicuous and often absent. One hundred British eggs average 32·5 × 23·5 mm.: maxima **35·2** × 23·7 and 32·0 × **25·0** mm.; minima **30·2** × 23·2 and 32·6 × **22·5** mm. Indian eggs are much the same but the minima are **31·1** × 23·1 and 32·0 × **21·5** mm.

Habits. In Sind this seems to be a sedentary bird and there is no influx of visitors during the Winter. It frequents the coast-line and the rivers but is also found at some considerable distance therefrom, keeping, however, always to open land such as sandy banks and shores, open desert country or the dry mud shores of lakes and swamps. It flies and runs swiftly, the latter in little spurts with head and tail down, then a halt in an erect position and then another little run. They feed on tiny crustacea, molluscs and insects. Ticehurst found those he examined had fed entirely on tiny crabs, whilst others have been found to contain nothing but sand-hoppers. Its breeding-note is a pretty trilling whistle uttered whilst it "butterflies" in the air. Its alarm-note is a shrill "too-it, too-it, ittup, ittup" (*Witherby*).

(2107) Leucopolius alexandrinus seebohmi.

THE INDIAN KENTISH PLOVER.

Charadrius alexandrinus seebohmi Hartert & Jackson, Ibis, 1915, p. 529 (Ceylon)
Ægialitis alexandrina. Blanf. & Oates, iv, p. 240 (part.).

Vernacular names. *Puchi-olēyiyā* (Cing.); *Sinna-kōtān* (Tam.).

Description. Slightly smaller than the preceding bird and with a rather smaller bill; it is also rather browner and darker.

Colours of soft parts as in the typical form.

Measurements. Wing 93 to 107 mm.; culmen 13 to 15 mm.

Distribution. Coasts of the Red Sea, Somaliland and Ceylon.

Nidification. This small race of Kentish Plover breeds in some numbers on the sandy pastures and shores of Ceylon and, less often, on the shores of inland tanks. The eggs, which number two or three, are laid in shallow depressions scraped by the birds and the eggs are often imbedded in the sand so that only the rounded tops are visible. They are only distinguishable from those of the typical form by their much smaller size. Forty eggs average 29·9 × 22·0 mm.: maxima **33·2** × 22·0 and 29·9 × **23·4** mm.; minima **29·1** × 22·3 and 29·3 × **21·3** mm.

Eggs have been taken from April to August and the principal breeding months are June and July.

Habits. Those of the species.

(2108) Leucopolius alexandrinus dealbatus

THE CHINESE KENTISH PLOVER.

Ægialites dealbatus Swinhoe, P. Z. S., 1870, p. 138 (S. coast of China).

Ægialitis alexandrina. Blanf. & Oates, iv, p. 240 (part.).

Vernacular names. None recorded.

Description. Differs from the two preceding birds in being slightly larger on an average and in having a longer bill; in breeding plumage the upper parts are often suffused with rufous.

Colours of soft parts as in the other races.

Measurements. Wing 106 to 113 mm.; tail 45 to 50 mm.; tarsus 28 to 30 mm.; culmen 17 to 18 mm. (one 19 mm.). The bill is also slightly stouter than in the other races. In a large series of Chinese specimens it measures 16 to 19 mm.

Distribution. The coasts and large tidal rivers of South China and the Indo-Chinese countries. Four specimens were obtained in Tenasserim and one as far West as Calcutta.

Nidification. Similar to that of the typical form. Jones took a fine series of its eggs on the Chefoo in 1902 and 1908: they are just like those of the European Kentish Plover and fifty average 32·4 × 22·8 mm.: maxima **34·9** × 24·3 and 33·3 × **24·4** mm.; minima 29·8 × **22·0** mm. Three appears to be the normal full clutch but in one nest five were found which seem to be the production of one bird.

The eggs were all taken in May and June and were laid in hollows scratched in sandy coastal flats.

Habits. Those of the species.

(2109) Leucopolius peronii.

THE MALAYAN KENTISH PLOVER.

Charadrius peronii Schlegel, Mus. Pays-Bas, p. 33 (1865). (Borneo).

Vernacular names. None recorded.

Description. Similar to *L. a. alexandrinus* but in breeding plumage the white band at the back of the neck is succeeded by a broad black band linking with the black breast-patches, whilst in Winter these patches are rufous and not black.

Colours of soft parts. "Iris dark chocolate-brown; bill black, orange at the base; orbital skin orange; feet grey, claws black" (*Everett*).

Measurements. Wing 92 to 101 mm.; tail 39 to 41 mm.; tarsus 28 to 30 mm.; culmen 14 to 15 mm.

Female has no black band across the forehead, whilst the black band above the scapulars and the breast-patches are brown mixed with rufous.

Distribution. The islands of the Malay Archipelago, Java to the Philippines, Borneo and the Celebes.

Nidification. Whitehead obtained young birds, almost fully fledged, and three eggs in Luzon on the 26th of May. The ground-colour was "pale cream, the whole shell with small blotches, streaks and zigzag pencilling of rich sepia and pale lavender." The measurements were 30 mm. by 42 mm.

Habits. Those of the genus. This is a resident bird throughout its habitat and nowhere overlaps any breeding race of *alexandrinus*, from which it differs only in its black collar on the back: it should, perhaps, be considered merely a subspecies of that bird.

Genus HÆMATOPUS.

Hæmatopus Linn., Syst. Nat., i, 10th ed., p. 152 (1758).

Type by mon., *N. ostralegus* Linn.

In this genus the bill is very long, compressed, slightly truncated at the end; the nostril is linear, narrow and placed near the base of a groove, which extends about half-way to the tip of the upper mandible; the wings are long and pointed, with the first primary longest; the tarsus is short, stout and reticulated throughout; there is no hind toe and the anterior toes are short, stout, narrowly edged with a membrane and slightly webbed between the toes, more especially between the third and fourth.

The genus is cosmopolitan, one species, with two races, being represented in India.

Hæmatopus ostralegus.

Key to Subspecies.

A. Bill shorter, culmen 77 to 90 mm.; wing shorter, 240 to 261 mm.	*H. o. ostralegus* *, p. 165.
B. Bill longer, culmen 80 to 98 mm.; wing longer, 262 to 282 mm.	*H. o. osculans*, p. 166.

(2110) Hæmatopus ostralegus ostralegus.

The Oyster-catcher.

Hæmatopus ostralegus Linn., Syst. Nat., 10th ed., p. 152 (1758) (Oeland); Blanf. & Oates, iv, p. 245.

Vernacular names. *Darya gajpaon* (Hind.); *Yerra-kali-ulanka* (Tel.).

Description. Whole head, neck, upper back, scapulars and inner secondaries black; lower back, rump and upper tail-coverts white, the last tipped with black; tail black with white base, broadest on the outermost rectrices; wing-coverts black, the greater with broad white edges, forming with the white outer secondaries a broad wing-bar; primaries black, the first three with long, white streaks on the inner webs; the fourth with a white shaft-patch near the tip, increasing to a broad white patch on the sixth to eighth primaries; remainder of lower parts white.

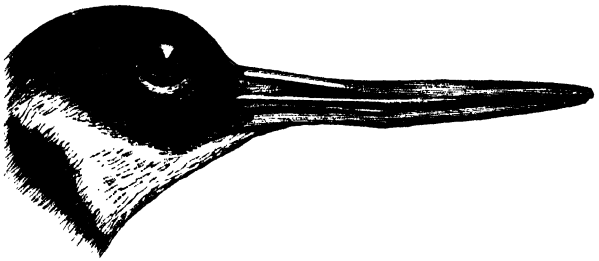

Fig. 27.—Head of *H. o. ostralegus* (juv.). $\frac{3}{5}$.

Colours of soft parts. Iris red or orange-red; bill bright orange-red, paler and duller at extreme tip; legs and feet dull brownish-purple or purple-red.

Measurements. Wing 240 to 261 mm.; tail 99 to 114 mm.; tarsus about 48 to 54 mm; culmen 77 to 90 mm.

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* Buturlin separates the Eastern European and West Asiatic form as *longipes* (Men. Orn. 1910, p. 36: Caspian Sea) but I cannot distinguish between this and typical *ostralegus*.

Young birds are browner and have the feathers of the mantle narrowly edged with whitish; the centre of the chin and throat are more or less white and there is a broad patch of white on the fore-neck.

Nestling in down. Upper parts sandy-brown; crown mottled with black, especially in the centre; a U-shaped black mark on lower back and rump; tail black, stippled with rufous barring; chin and throat fulvous-brown with black bases, fore-neck with a still blacker patch; rest of underparts white; thighs mottled brown and fulvous.

Distribution. The sea-coasts and islands off the greater part of Europe and Western Asia. In Winter South to Sind, Cutch and Khatiawar in great numbers, less common South but recorded from Ceylon. Records from Eastern India and Burma probably all refer to the next race.

Nidification. The Oyster-catcher breeds during May and late April in England and rather later farther North. As a rule it keeps to the coast-line, making its nest on sand and shingle beds above high-water mark but often its nest may also be found on fallow and ploughed fields, marshy land and heather far inland. The nests are scratchings in the soil or sand, always neatly lined with scraps of shell, small white stones, bits of glass etc. and, more than once, I have seen nests completely lined with sea-pink flowers. The eggs, three or four in number, vary from pale creamy-stone to a fairly warm buff, whilst the markings consist of small blotches and spots of reddish-brown to blackish-purple. Less often the marks form scrolls or large blotches. Exceptional eggs are quite green when fresh but this colour fades very rapidly. Jourdain gives the average of one hundred and one eggs as 57·0 × 40·0 mm.: maxima **70·1** × 37·4 and 62·1 × **48·9** mm.; minima **51·6** × 40·4 and 62·6 × **35·0** mm.

Habits. The Oyster-catcher is one of the wariest and shyest of our Indian Winter visitors and is, with us, almost entirely a coastal bird, excepting when migrating to and fro. It is found in small or large parties either hunting along the shores for molluscs and crustacea or sitting during the heat of the day in closely-packed flocks just above the tide. Its plaintive whistle of two notes is shrill and high-pitched and it has a short, shrill single note of alarm.

(2111) Hæmatopus ostralegus osculans.

THE CHINESE OYSTER-CATCHER.

Hæmotopus osculans Swinhoe, P. Z. S., 1871, p. 405 (N. China).
Hæmatopus ostralegus. Blanf. & Oates, iv, p. 245 (part.).

Vernacular names. None recorded.

Description. Similar to the preceding bird but larger and with a decidedly longer bill; the amount of white on the primaries is generally, but not always, less, the first primary seldom showing any white at all on the inner web.

Colours of soft parts as in the typical race.

Measurements. Wing 262 to 280 mm.; tail 101 to 112 mm.; tarsus about 52 to 58 mm.; culmen 80 to 98 mm.

Distribution. Japan, North China to North Burma and extreme Eastern Bengal.

Nidification. Nothing recorded. An Oyster-catcher, which is probably of this race, has been obtained, with its eggs, breeding on an island in the Sunderbunds, but the skin has not been available for comparison.

Habits. This has always been considered to be a Winter visitor only to India but the discovery of an Oyster-catcher breeding in Bengal makes further information on this point desirable. In flight, voice etc. this race differs in no way from the typical form.

Subfamily CHARADRIINÆ.

Dr. Lowe thus diagnoses this subfamily :—"Pluvialine forms in which the lacrymals are not free but are merged on the supra-orbital rim, in which there is a conspicuous foramina for the nasal duct immediately caudad of the nasals, in which the supraorbital grooves are deeply sculptured, often perforated with foramina, and extend well back to the anterior margins of the parietals, and in which the supraorbital rim is conspicuously raised, everted, or conicid."

Key to Genera.

A. A white ring round the neck	Charadrius, p. 167.
B. No white ring round the neck.	
a. Plumage brown above, not spotted yellow	Cirrepedesmus, p. 173.
b. Plumage above spotted with yellow; no dark band across the chest	Pluvialis, p. 175

Genus **CHARADRIUS.**

Charadrius Linn., Syst. Nat., 10th ed., p. 150 (1758).

Type by taut., *Charadrius hiaticula* Linn.

In the genus *Charadrius* as now restricted we have the Ringed Plovers only, distinguished from the other genera by having a white ring round the neck as well as by certain structural characters. In appearance they are very like the genus *Leucopolius*, containing the Kentish Plovers, but these latter have the lacrymals free; the plumage of the young also differs somewhat. *Charadrius* has three toes and the tarsi reticulated; the wing is long with the first primary longest.

Key to Species.

A. Shafts of all primaries white near end; wing 129 to 138 mm.	*C. hiaticulus*, p. 168.
B. Shaft of first primary white throughout, of others dark; wing 102 to 121 mm.	*C. dubius*, p. 169.
C. Shafts of all primaries dark, or first only white near tip; wing 139 to 152 mm.	*C. placidus*, p. 172.

Charadrius hiaticulus.

Charadrius hiaticulus Linn., Syst. Nat., i, 10th ed., p. 150 (1758).

Type-locality: Sweden.

The typical form is slightly larger than the Eastern form and decidedly paler.

(2112) Charadrius hiaticulus tundræ.

The Eastern Ringed Plover.

Ægialitis hiaticola tundræ Lowe, Bull. B. O. C., xxxvi, p. 7 (1915) (Yenesei).
Ægialitis hiaticula. Blanf. & Oates, iv, p. 243.

Vernacular names. None recorded.

Description. Forehead, lores to upper ear-coverts black; a broad line across the forehead from eye to eye white; anterior crown black; under and behind the eye a white semi-ring, a short broad supercilium white; crown and nape brown; a white collar on the hind-neck, followed by a broad black band; upper parts dark brown; primaries blackish, the shafts white in the middle, brown at the base and tip and with a white patch on the outer web of the fifth to the secondaries, increasing on the latter till the central is nearly all white, then decreasing until the inner are like the back; tail brown with a broad subterminal white band and white tip, the latter increasing until the outermost pair of feathers are almost pure white; the black forehead is continued as a broad band to the ear-coverts; chin, throat and sides of neck white, meeting the white hind-collar; a broad band of black across the fore-neck and upper breast meeting the black hind collar; remainder of under parts white.

Colours of soft parts. Iris brown; eyelids yellow; bill orange-yellow, the dertrum black; legs and feet orange-yellow.

Measurements. Wing 120 to 138 mm.; tail 52 to 64 mm.; tarsus about 22 to 26 mm.; culmen 13 to 15 mm.

Young birds have no black on the head or breast, this being replaced by brown; the black breast when first assumed has whitish fringes.

Nestling in down. Crown and lower back greyish-buff speckled with darker brown; a black line through the eye round the nape and a U-shaped black mark on the lower back; hind-neck and underparts white.

Distribution. Eastern Russia from the Petchora to East Siberia. In Winter South to Persian Gulf, India and China, extending to N.E. Africa.

Nidification. The Eastern Ringed Plover, like the Western race, makes a nest in a hollow, scratched out by itself, of tiny pebbles, shells or scraps of shells or any other small articles which it can obtain round about. The favourite site is on the sea-shore, above high tide, or on the pebbly beaches of big rivers but it also breeds in marshes and swamps far from these. The eggs, four in number, are not distinguishable from those of the Western race. The ground-colour varies from pale yellowish to fairly warm buff or olive-stone, whilst the marks consist of small spots of blackish, numerous everywhere but rather more so at the larger end. The few eggs I have seen average about 32·0 × 25·0 mm.

The breeding-season is May and early June in the South and June the 5th to July the 10th in the North.

Habits. The Ring-Plovers collect in some numbers during the non-breeding season but even at that time are often seen singly or in pairs only. They frequent the shores of both seas and rivers, run with great speed, though generally for a few yards only at a time, and fly well. Their food consists of insects, small molluscs, flies, worms etc. Their call has not been described but is probably the same as that of *C. h. hiaticula*. The notes of the latter bird have been described by Witherby as follows. Love song a sweet trilling "troo-i, troo-i"; call-note a harsh "trr" alarm-notes "pee-ip" or "pen-y-et."

Charadrius dubius.

Key to Subspecies.

A. Larger. Wing 115 to 121 mm.
  a. Bill longer and less slender, 13 to 14 mm. *C. d. dubius*, p. 169.
  b. Bill shorter and more slender, 12 to 13 mm. .... *C. d. curonicus*, p. 171.
B. Smaller. Wing 102 to 114 mm.......... *C. d. jerdoni*, p. 171.

(2113) Charadrius dubius dubius.

THE CHINESE LITTLE RINGED PLOVER.

Charadrius dubius Scop., Del Flor. et Faun., Insubr., ii, p. 93 (1786) (Luzon).
Ægialitis dubia. Blanf. & Oates, iv, p. 241 (part.).

Vernacular names. None recorded.

Description. This species is a small replica of the preceding species. It differs in having the shaft of the first primary all white, that of the others all dark brown; there is no white patch on the outer webs of the primaries, and the secondaries are all coloured like the back: the black fore-crown is nearly always divided from the brown by a very narrow white line.

Colours of soft parts. Iris brown; bill black, the extreme base of the upper and rather more of the lower mandible yellow; legs and feet yellow in breeding-season; greenish-yellow, dusky olive or greenish-brown in non-breeding plumage.

Measurements. Wing 115 to 119 mm.; tail 48 to 58 mm.; tarsus 22 to 24 mm.; culmen 13 to 14 mm.

In non-breeding and **young birds** the same differences occur as in the Ringed Plover.

Distribution. South China and Formosa throughout the Malay Archipelago, the Indo-Chinese countries and once near Mergui in Tenasserim, whence I had two skins sent me of birds shot in January 1898.

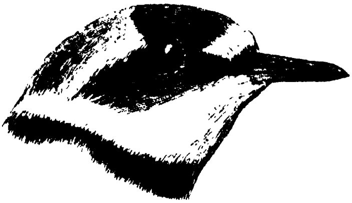

Fig. 28.—Head of *C. d. dubius.* $\frac{1}{1}$.

Nidification. La Touche and Jones have both described the nesting of this little Plover, the former in Chihli, the latter near Shantung, Wai-hei-wei. They prefer shores of big rivers and fresh water to the sea-shore though they breed there also. Many birds nest by themselves but in other cases they collect in small scattered colonies, making no nest beyond a shallow scratching in which there may or may not be a few pebbles. They lay four eggs of which the ground-colour varies from a pale creamy or yellowish-buff to a warm reddish-buff. The markings consist of freckles or tiny specks and spots of dark brown and secondary markings of the same character of lavender. These are distributed freely over the whole surface but in some eggs are more numerous at the larger end. Sixty eggs average 27·7 × 21·8 mm.: maxima **31·2** × 22·0 and 30·3 × **23·0** mm.; minima **27·7** × 22·1 and 28·6 × **21·0** mm. In shape they are modified peg-top, the surface smooth but not glossed.

The breeding-season is from the end of April to early June, a few clutches having been found as late as July.

Habits. Much the same as those of the next and better-known bird.

(2114) Charadrius dubius curonicus.

THE EUROPEAN LITTLE RINGED PLOVER.

Charadrius curonicus Gmelin, Syst. Nat., i, (2) p. 692 (1789) (Curonia).
Ægialitis dubia. Blanf. & Oates, iv, p. 241 (part.).

Vernacular names. *Zirrea* (Hind.); *Bytu-ulanka, Rewa* (Tel.).

Description. A decidedly paler bird than the typical form; on an average also the black on the crown and the breast-band is rather less in extent.

Colours of soft parts as in the preceding form.

Measurements. Wing 114 to 121 mm.; culmen 12 to 13 mm.

Distribution. Breeding throughout Europe; North and Central Asia to North-East Siberia. In Winter South to Africa, South-Western Asia and to the greater part of China, India etc.

Nidification. This little Plover does not breed within Indian limits. In Europe, like the preceding bird, it breeds both on the sea-shore and on inland waters, making a similar nest and laying four very similar eggs, which are not quite so richly coloured and considerably bigger. One hundred eggs average 29·8 × 22·1 mm.: maxima **32·8** × 23·0 and 30·1 × **23·5** mm.; minima **27·3** × 21·1 and 28·6 × **21·0** mm. The breeding-season commences in late March on the Mediterranean, in May in South Europe and from the end of May to the end of June farther North.

Habits. Very much like those of the Ringed Plover. They have much the same rapid run, made in little spurts and their wheeling, twisted flight is as swift and powerful. Their food also consists of the same insects and mollusca etc. but their alarm-note is different and has been described as sounding like "wheeear" constantly repeated.

(2115) Charadrius dubius jerdoni.

JERDON'S LITTLE RINGED PLOVER.

Ægialitis jerdoni Legge, P. Z. S., i, p. 125 (1831) (Ganges).
Ægialitis dubia. Blanf. & Oates, iv, p. 241 (part.).

Vernacular names. *Zirrea* (Hind.); *Bytu-ulanka, Rewa* (Tel.).

Description. Differs from both the preceding forms in its much smaller size. The frontal black line is smaller than in *curonicus*; the colour of the base of the bill is a much brighter yellow, whilst the orbital skin is also generally better defined and a brighter yellow; the general colour is paler.

Colours of soft parts. Except as above noted the same as in the other races.

Measurements. Wing 102 to 111 mm., sexes alike; culmen 11·5 to 12·5 mm.

Distribution. All India, Ceylon, throughout Burma and the greater part of the Malay States; Siam, Annam and Cochin China.

Nidification. Jerdon's Little Ringed Plover breeds during March and April, a few birds laying in the last week of February. The eggs are laid in hollows scratched by the birds in sand-banks in the beds of rivers, less often on the banks of the rivers themselves and, very occasionally, in waste land or sandy, stony fields some distance therefrom. The birds very commonly select a site near some landmark, such as a piece of fallen timber, an extra large lump of sand or a tuft of grass. The eggs number three or four and are merely small editions of those of the preceding bird but, as a series, are more richly-coloured buff and have even finer markings. Sixty eggs average 27·5 × 20·7 mm.: maxima **29·5**×20·8 and 27·4 × **21·6** mm.; minima **25·0**×19·6 and 26·1 × **19·0** mm.

Habits. This little Plover is found wherever there are rivers with clean sandy banks but will never be found frequenting those with only mud-banks. They may usually be seen in pairs or singly, but occasionally unite in small flocks. Their actions on the ground and their flight is very like that of the Common Ringed Plover and they feed on much the same food but are especially fond of flies, mosquitoes etc., which they catch very expertly.

(2116) Charadrius placidus.

The Long-billed Ringed Plover.

Charadrius placidus Gray, Cat. Mam. Birds Nepal, p. 70 (1863) (Nepal).
Ægialitis placida. Blanf. & Oates, iv, p. 244.

Vernacular names. None recorded.

Description. Very similar to the Ringed Plover but larger and with a much larger bill. The shaft of the first primary is brown, paler and yellowish towards the tip but never white; the black on the lores and cheeks is replaced by brown or blackish-brown; the forehead is wholly white.

Colours of soft parts. Iris brown; bill black, the gape and extreme base of lower mandible yellowish; legs and feet and margins of eyelids yellow.

Measurements. Wing 139 to 152 mm.; tail 76 to 78 mm.; tarsus about 31 to 34 mm.; culmen 18 to 20 mm.

Distribution. Breeding throughout Eastern Siberia, Manchuria, Japan and North-Eastern China. In Winter migrating South to Southern China, Burma, Indo-Chinese countries and Northern India. It has been obtained in Nepal, Sikkim, Bhutan Duars, Assam and Eastern Bengal.

Nidification. The Long-billed Ringed Plover breeds from the middle of April to the middle of May, laying three or four eggs, generally the latter, in shallow hollows scratched out by the birds and lined with scraps of twigs or a little grass. The sites selected are generally wide stretches of shingle and may be some little distance from the edge of the water. Though not breeding in colonies, two or three, or more, pairs may be found breeding on the same shingle-beach. The eggs are typical Ringed Plover's eggs but the markings are very minute and the ground-colour seems invariably to be a pale lilac-pink, a tinge occurring in no other Ringed Plover's eggs. La Touche gives the average of thirty eggs as 35·9 × 26·4 mm.; my own maxima are: **37·0** × 26·9 and 35·0 × **27·2** mm.; minima **34·0** × 26·9 and 35·4 × **26·0** mm. The birds are said to be extremely tame and confiding, returning to sit on their eggs within a very few yards of the observer.

Habits. Those of the genus. This species is almost entirely confined to the coast-line and the shores and sand-banks of the larger rivers, along which they may be found a thousand miles from the sea. They are, perhaps, more lethargic than most Ringed Plovers but when required can run or fly as fast as any of them. They are said to be good swimmers also but this is true of all the genus. They feed largely on flies and small coleoptera.

Genus **CIRREPEDESMUS.**

Cirrepedesmus Bonaparte, Compt. Rend. Acad. Sci. Paris, xliii, p. 417 (1856).

Type by taut., *Charadrius atrifrons* Wagler.

In this genus there is no white ring round the neck and the bill is decidedly shorter than in *Charadrius* and is shorter than in *Pagoa*, the dertrum is much swollen and occupies about half the culmen; the legs are comparatively short, the feet medium and the tarsus reticulated throughout. I cannot separate the Large Sand-Plover generically from *Cirrepedesmus*, all the characters seeming to be the same except that *Pagoa*, which Mathews creates for the Large Sand-Plover, has a slightly longer bill.

Key to Species.

A. Bill shorter than middle toe without claw .. *C. mongolus*, p. 173.
B. Bill longer than middle toe with claw .... *C. leschenaultii*, p. 175.

Cirrepedesmus mongolus.

Charadrius mongolus Pallas, Reise Russ. Reichs., iii, p. 700.

Type-locality: Salt Lakes of Mongolia.

Differs from the form occurring in India in having the forehead pure white; the chestnut-rufous of the breast is deeper and the colour of the upper plumage a little darker.

(2117) Cirrepedesmus mongolus atrifrons.

THE PAMIRS LESSER SAND-PLOVER.

Charadrius atrifrons Wagler, Isis, 1829, p. 650 (Bengala).
Ægialitis mongolica. Blanf. & Oates, iv, p. 238.

Vernacular names. None recorded.

Description. Forehead, lores, cheeks and ear-coverts black, more or less marked with white; anterior crown, supercilia and hind-neck pale fulvous-chestnut; posterior crown and upper plumage cinereous-brown, the shafts faintly darker; sides of the rump and upper tail-coverts white; tail brown with white tip, the outermost feathers nearly all white; primaries blackish, the whole of the shaft of the first primary and the terminal halves of the others white: a white patch on the sixth and succeeding primaries on both webs; outer secondaries tipped white; chin, throat and fore-neck white; upper breast and sides of lower pale chestnut-rufous; remainder of lower plumage white.

Colours of soft parts. Iris brown; bill black; legs and feet fleshy-grey, yellowish-olive to bluish or olive-slate colour.

Measurements. Wing 124 to 129 mm.; tail 44 to 53 mm.; tarsus 33 to 34 mm.; culmen 16 to 18 mm.

In non-breeding plumage the forehead, lores and ear-coverts are fulvous, the ear-coverts mixed with brown; the collar on the hind-neck is obsolete or wanting and the rufous on the breast and flanks is much less in extent.

Young birds have pale fringes to the feathers of the upper parts.

Distribution. This Sand-Plover breeds in the Pamirs and throughout the higher plateaus of Kashmir, Ladak, Tibet and North West China. Probably also in Turkestan and parts of Southern Siberia. In Winter it is found over an enormous area of Africa and Southern Asia. In India it occurs commonly on the coasts of North-West India as far South as Bombay and more rarely farther South and inland on the bigger rivers. It occurs in the Andamans but certainly does not breed there normally, though Hume received skins of young birds obtained there in May, July and September.

Nidification. Osmaston, Whistler and Ludlow have found this Plover breeding at Ladak and Tibet from 12,500 feet upwards, probably up to 16,000 feet, during June and July. Osmaston found hard-set eggs on the 26th and 27th of June at 13,200 and 13,400 feet and fresh eggs at Shushal, 14,500 feet, on the 2nd of July as well as freshly-hatched young. Osmaston sent me a beautiful series of these eggs and Whistler and Ludlow obtained others. Three seems to be the full clutch, not four, and these in appearance are exactly like large eggs of *Charadrius hiaticula*, except that one set has a deep rich buff ground. In the other clutches the ground-colour is pale stone-yellow, in some with a faint touch of green or buff. In every egg the markings consist of small spots and specks of black, the secondary, of lavender, are obsolete and difficult to see. Twenty-five eggs average 37·0 × 26·3 mm.: maxima **39·7** × 27·0 and 38·1 × **27·1** mm.; minima **35·4** × 26·0 and 36·5 × **25·1** mm. There is no nest beyond a scraping in the sand or earth.

Habits. Osmaston says that this Plover is common in Ladakh between 13,000 and 15,500 feet near streams and they may be often seen running about in the stony, sandy plains adjacent to them, where they feed at a considerable distance from the water. The note is described as a vibrating call, reminding one of the Jungle Night-jar or the song of the Indian Redstart. Their flight and run are exactly like those of the birds of the genus *Charadrius* and their food consists of tiny insects, flies, coleoptera etc.

(2118) Cirrepedesmus leschenaultii.

THE LARGE SAND-PLOVER.

Charadrius leschenaultii Lesson, Dict. Sci. Nat., xlii, p. 36 (1836) (Pondicherry, India).
Charadrius geoffroyi. Blanf. & Oates, iv, p. 237.

Vernacular names. None recorded.

Description. A much bigger bird than the Lesser Sand-Plover and also differs in having a white forehead, less rufous on the breast and flanks and a more rufous sandy tinge to the upper parts.

Colours of soft parts as in the Lesser Sand-Plover.

Measurements. Wing 128 to 140 mm.; tail 50 to 57 mm.; tarsus about 35 to 38 mm.; culmen 23 to 25 mm.

Distribution. Breeding in Japan, Corea, Formosa, Hainan and possibly North-East China. In Winter South to Australia and West to Eastern Africa.

Nidification. Unknown.

Habits. The same as those of the preceding bird.

Genus PLUVIALIS.

Pluvialis Schaeffer, Mus. Ornith., p. 45 (1789).

Type, *Charadrius apricarius* Linn.

Superficially very like the genus *Squatarola*, without a hind toe. In this genus the bill is slender and short, with the dertrum but slightly swollen; the nostrils are linear and are placed in a groove which extends about two-thirds the length of the upper mandible; the wings are pointed, the first primary longest, the outer secondaries short and the inner long and pointed; tail short and rounded; tarsi reticulated all round with hexagonal scales; outer and middle toes connected by a short web at their bases; the sexes are alike and there is a distinct breeding plumage.

Key to Species.

A. Axillaries pure white	*P. apricarius*, p. 176.
B. Axillaries greyish-brown..................	*P. dominicus*, p. 178.

Pluvialis apricarius.

In 1922 Mrs. A. C. Meinertzhagen separated the bird breeding in the British Isles under the name of *C. a. oreophilus* on account of certain minor differences in the breeding plumage. As all our Indian specimens in the British Museum are in non-breeding plumage it is impossible to say to which race they belong until more material is available. Under the circumstances I only include the typical more Eastern form, which is the one we should expect to see.

(2119) Pluvialis apricarius apricarius.

THE GOLDEN PLOVER.

Charadrius apricarius Linn., Syst. Nat., 10th ed., i, p. 150 (1758) (Oeland, Sweden).
Charadrius pluvialis. Blanf. & Oates, iv, p. 235.

Vernacular names. *Chota Battan* (Hind.).

Description—Breeding plumage. Forehead and lores yellowish-white, spotted with brown; short supercilia yellowish; whole upper plumage blackish-brown, each feather with a golden tip and spots along the edges, giving the whole a spangled-gold appearance; primaries blackish, the shafts brown with a white patch near the tip, this white extending on to the webs in the innermost; in freshly-moulted birds there is a fine edging of white to the tips: sides of the head mottled white, brown and gold; chin white; throat, fore-neck and vent black, surrounded by a narrow broken white band; flanks like the back; axillaries and under tail-coverts white, the latter spangled with gold and brown except in the centre.

Colours of soft parts. Iris brown; bill, legs and feet black.

Measurements. Wing 181 to 194 mm.; tail 60 to 75 mm.; tarsus 37 to 42 mm.; culmen 21 to 26 mm.

In Winter the upper parts are sometimes rather duller; the chin and throat are white, faintly streaked darker, the breast is mottled gold and brown, the gold disappearing on the lower breast, which with the flanks are white with brown bars; centre of abdomen, vent, and under tail-coverts white, the latter tipped and barred on the lateral feathers with gold and brown.

In many specimens the gold on the breast is replaced by brown-grey.

Young birds are like the adult in non-breeding dress but have the underparts darker, the breast more marked with brown and the posterior flanks and abdomen barred with brown and marked faintly with pale gold.

Nestling in down. Mottled gold and black above, except on the hind-neck, which is white or nearly so; below dull white.

Distribution. Europe, Northern Africa, Western Asia to Lake Baikal, migrating South to Tropical Africa and India East to Assam.

Nidification. The Golden Plover breeds from the 20th of April to mid-May in the Southern parts of its habitat and as late as the middle of June in the extreme North. The nests are made on moorlands in thin heather or deep peat-moss, sometimes on almost bare ground. The hollow selected may be either natural or one made by the birds and is generally well lined with matted grass, leaves, scraps of heather, twigs etc. The nest is one of the hardest to find of all the Waders and Plovers, as the cock keeps a very careful look out for intruders and, perched on some little eminence, well away from the nest, gives warning of their arrival to his wife, who sneaks quietly away. The eggs, four in number, are generally very handsome. The ground-colour varies from pale yellowish-stone to deep rich buff, while the markings of dark chocolate-brown and black are bold and large, standing up well against the ground-colour. Rey gives the average of twenty-six eggs as 51·4 x 34·1 mm.

Habits. The Golden Plover is a rare visitor to India during the Winter. Specimens have been shot at Quador in Baluchistan, Warachi, Lehwan and near Lucknow. Another specimen was obtained by Captain Hanna and, finally, I shot two specimens in Dibrugarh in Assam. In Winter it associates in large flocks in its own country but in India single birds only are met with, though associating with flocks of other migratory Waders. Those obtained by me in Assam were both shot out of large flocks of the Eastern Golden Plover, in one case three of the latter falling to the same shot and in the second case, to a right and left, five birds fell. Both birds were in full breeding plumage, being shot in late March as they were leaving for the North. They are wonderful fliers, wheeling and twisting with the greatest rapidity and are so wary that they are very difficult to approach within shot. Their call is a shrill but very pleasant "Tuill-tuill," constantly repeated when on the wing, whilst the warning-call is a rather sad "tu-wee, tu-wee." Their food consists of all kinds of insects, beetles, berries and shoots of many plants and, when feeding by the sea, of small mollusca, crustaceans and sea-worms.

Pluvialis dominicus.

Charadrius dominicus Muller, Natursystem, Suppl., p. 116 (1776).

Type-locality: Santo Domingo.

The type-form differs from the Eastern in having the upper parts more golden and also in having a longer and stouter bill.

(2120) Pluvialis dominicus fulvus.

THE EASTERN GOLDEN PLOVER.

Charadrius fulvus Gmelin, Syst. Nat., i, (2) p 687 (1789) (Tahiti); Blanf. & Oates, iv, p. 234.

Vernacular names. *Chota-battan* (Hind.); *Kotan* (Tam., Ceylon); *Rana Watuwa, Oliya, Maha Oliya* (Cing.).

Description.—Breeding plumage. Forehead broadly white, running back as a broad white supercilium and down the sides of the neck and breast; lores black; axillaries greyish-brown edged and tipped with white and centred darker. Otherwise similar to the preceding bird but with less gold spangling, especially on the wings.

Colour of soft parts as in the Golden Plover.

Measurements. Wing 160 to 165 mm.; tail 60 to 64 mm.; tarsus about 40 to 44 mm.; culmen 22 to 27 mm.

In Winter differs from the Golden Plover in being a little duller above and always having grey axillaries.

Distribution. Breeding in Siberia from the Kara Sea to West Alaska and South to the Amore River. In Winter South to India, Burma, the Malay Peninsula and Archipelago, the Indo-Chinese countries and South China to Australia.

Nidification. The Eastern Golden Plover breeds, according to Buturlin, from the Kara Sea to the Yenesei, in the same localities as the Golden Plover and thence right across Siberia. Nest and eggs are exactly like those of that bird but on an average the latter are duller and smaller. Three clutches in my collection were taken at the end of June and on the 2nd of July. These eggs and seven others measured by Jourdain average 47·6 × 33·4 mm.: maxima **50·0** × 32·7 and 48·3 × **35·6** mm.; minima **45·0** × **31·8** mm.

Habits. Those of the genus. The Eastern Golden Plover is only a migrant to India, never breeding within our limits. It is very common in Eastern India from Assam to Ceylon but becomes more rare to the West and is uncommon in Sind and the North-Western Provinces. In Assam and Burma it often occurs in large flocks, sometimes of several hundreds and its melodious double whistle is one of the charms of a cold weather morning in the open plains. It is as wild and difficult to approach as its European cousin and as good to eat when finally shot. It feeds on all kinds of insects, worms etc. but very largely on small grasshoppers and tiny coleoptera.

Subfamily VANELLINÆ.

This subfamily contains a very large number of genera, mostly of the larger Plovers and Lapwings and it also embraces those genera included in the *Lobi-vanellinæ*, a group which Lowe created provisionally but now considers insufficiently distinct from his *Vanellinæ* to deserve recognition. His diagnosis of the *Vanellinæ* is as follows:—

Pluvialine forms in which the lacrymals are not free but are merged in the supra-orbital ring, in which there is a conspicuous foramen for the nasal duct immediately caudad of the nasals, in which the supra-orbital grooves are deeply sculptured, often perforated with foramina, and extend well back to the anterior margin of the parietals, and in which the supra-orbital rim is conspicuously raised, everted or corniced.

Key to Genera.

A. Bill moderate, not longer than head, nasal groove not extending more than half the length of the upper mandible.	
a. No wattle in front of the eye.	
a' No spur on bend of wing.	
a^2. A hind toe present.	
a^3. Head with long crest	VANELLUS, p. 179.
b^3. Head not crested	CHETTUSIA, p. 181.
b'. A sharp spur on bend of wing......	HOPLOPTERUS, p. 184.
b. A wattle present in front of the eye.	
c'. A small hind toe present.	
b^2. Tarsus reticulated in front	LOBIVANELLUS, p. 186.
c^2. Tarsus transversely shielded in front.	MICROSARCOPS, p. 191.
d'. No hind toe	LOBIPLUVIA, p. 189.
B. Bill very long; nasal groove extending to more than half the length of the bill.	
c. Bill straight; no hind toe	HIMANTOPUS, p. 192.
d. Bill curved downwards.	
e'. A hind toe present	RECURVIROSTRA, p. 194.
f'. No hind toe present	IBIDORHYNCHA, p. 196.

Genus **VANELLUS**.

Vanellus Brisson, Ornith., i, p. 48 (1760).

Type by taut., *Tringa vanellus* Linn.

This genus is distinguished from all other genera in the *Vanellinæ* by the presence of a large recurved crest and by the absence of either lappet or wing-spur.

The bill is short and slender, with a flattened culmen and slightly swollen dertrum; the linear nostril is placed in a groove which extends over more than half the upper mandible; the wings are very rounded. In the male the third primary is longest and the second equals the fourth; in the female the second and third are longest and the first equals the fourth: the tarsus is moderate and reticulated all round; there is a small hind toe.

The genus contains but one species, which extends over the greater part of the Temperate Old World.

(2121) Vanellus vanellus.

THE LAPWING, PEEWIT, OR GREEN PLOVER.

Tringa vanellus Linn., Syst. Nat., 10th ed., i, p. 148 (1758) (Sweden).
Vanellus vulgaris. Blanf. & Oates, iv, p. 130.

Vernacular names. None recorded.

Description.—Breeding plumage. Face, forehead, crown and long crest of narrow feathers black, glossed with green; feathers round the eye, lower ear-coverts, sides of the head and neck white; a black patch from the black face to the upper ear-coverts; back, rump, scapulars and innermost secondaries bronze-green, highly glossed; the scapulars marked with violet-purple; upper tail-coverts cinnamon; tail white with a very broad black subapical band, glossed green; wing-coverts glossed deep blue, purplish in some lights; primaries and outer secondaries black with pale brown tips to the first four primaries; throat, fore-neck and breast black, the black running up to the back on the anterior neck: under tail-coverts cinnamon; under wing-coverts black; remaining lower plumage and axillaries white.

Colours of soft parts. Iris brown; bill black; legs and feet orange-brown.

Measurements. Wing 220 to 236 mm.; tail 108 to 119 mm.; tarsus 44 to 48 mm.; culmen 23·0 to 26·5 mm. (*Hartert*).

In non-breeding plumage the crown is brown rather than black; the face, chin, throat and fore-neck are white, more or less speckled or marked with brown or black; the scapulars, inner wing-coverts and innermost secondaries are edged with fulvous as are the black feathers of the breast.

Young birds have the upper parts brown, each feather edged with fulvous; the back is slightly glossed with purple-bronze and the wings with green; lower plumage like the adult in Winter.

Nestling in down. Hind-neck dull white, remaining upper parts fulvous-brown, mottled with black; a black line from eye to eye round the back of the crown; a broad, but broken median black line down the back and a fairly well-defined black line from wing to wing bordering the back and round the tail; a black line from the side down the thighs; upper fore-neck blackish; remaining underparts white or dull fulvous-white.

Distribution. The whole of Europe and North Asia. In Winter South to North Africa, India, Burma, the Indo-Chinese countries and South China. In India it is comparatively common in the Punjab and North-West. It is a regular, though not common visitor, to Assam and Eastern Bengal and has also been shot in Burma.

Nidification. The Lapwing breeds from the end of March to the end of May but most eggs are laid in early April. The eggs are laid in depressions in the earth, sometimes just a footprint or natural hollow, sometimes scratched out by the birds. These may be quite bare or fairly well lined with moss, weeds or grass. The eggs, four in number, vary in ground-colour from pale yellowish-stone, pale olive-brown or greyish-brown to fairly warm buff or brown, profusely blotched and spotted with dark brown all over. In shape they are rather peg-topped, whilst one hundred British eggs average 47·0 × 33·7 mm.: maxima 58·0 × 32·5 and 47·4 × 37·2 mm.; minima 42·3 × 33·5 and 44·7 × 31·2 mm.

Habits. In India the Lapwing is not uncommon in the North-West and North, as far as the United Provinces, from October to March but its range extends a good deal farther East and there are few years in which some are not seen in Cachar and Lakhimpur, South and East of the Brahmaputra. It assembles in enormous flocks in Europe but in India either in small flocks, in pairs, or singly. Its flight is a leisurely flapping but it indulges in much tumbling and twisting about and is capable of great speed when frightened. The well-known call is supposed to be syllabified in its name of "Pee-wit" but is more a mewing cry than this word would express. It feeds on all kinds of insects, worms etc. and destroys many wire-worms on ploughed land. Its eggs are famous all over Europe as an article of food for epicures.

Genus CHETTUSIA.

Chettusia Bonaparte, Icon. Faun. Ital. Introduc., p. 12 (1841).

Type by mon., *Charadrius gregarius* Pallas.

I retain, with some doubt, the two species included in this genus by Blanford. The two differ both in colour and in structure rather definitely and *Chettusia leucura* should perhaps be separated under the name *Eurypterus* of Sharpe.

This genus differs from *Vanellus* in having no crest and in having much white on the wing; in *C. gregaria* the tarsus is reticulated but in *C. leucura* the reticulations become small scutellations.

Key to Species.

A. Some black on the tail; a broad white supercilium	*C. gregaria*, p. 182.
B. Tail all white; no supercilium	*C. leucura*, p. 183.

(2122) Chettusia gregaria.

THE SOCIABLE LAPWING.

Charadrius gregarius Pallas, Reise Reichs. Russ., i, p. 456 (1771) (Volga).
Chettusia gregaria. Blanf. & Oates, iv, p. 231.

Vernacular names. None recorded.

Description.—Breeding plumage. Forehead and broad supercilium white; crown, lores and a line behind the eye black; hindneck narrowly white, meeting the supercilia; chin white; upper plumage, throat and breast light ashy-grey; upper tail-coverts white; tail white, the central feathers suffused with grey; wing-coverts ashy-grey, the greater secondary coverts broadly edged white; primary with coverts and primaries black, the latter with concealed black bases and the innermost one or two with white tips and edges to the inner webs; outer secondaries pure white, inner like the back; lower breast black, the longest anterior feathers chestnut; vent, posterior flanks, abdomen and under tail-coverts white; tail white with a broad black band on all but the two outermost pairs of feathers and with only a black patch on the inner webs of the third outer pair.

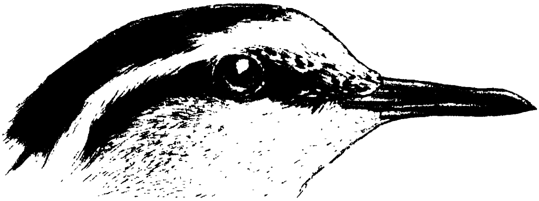

Fig. 29.—Head of *C. gregaria*. ¾.

Colours of soft parts. Iris brown; bill, legs and feet black.

Measurements. Wing 196 to 204 mm.; tail 84 to 91 mm.; tarsus 59 to 62 mm.; culmen 29 to 31 mm.

In non-breeding plumage. The crown is brown, the feathers sometimes showing black centres; the forehead and crown more or less buffy-white; chin and throat white; breast smoky-grey, mottled with brown; abdomen, vent and posterior flanks smoky-white.

Young like the adult in non-breeding plumage, the feathers of the upper parts edged with light rufous.

Distribution. South-Eastern Russia and Asia as far as Central Siberia, migrating South to North Africa and India and West to Western Europe.

Nidification. The Sociable Plover breeds in great numbers in the Southern and Eastern Russian Steppes from the end of March to early July, most eggs being laid between the 15th of April and the 15th of June. The nest is a scratching in the earth, unlined or lined with leaves, grass, moss etc. The eggs are four in number and much like those of the common Peewit, though the pale blue-grey type, so rare in the eggs of that bird, is comparatively common in this. Eighty-five eggs average 46·2 × 33·5 mm.: maxima **49·4** × 31·9 and 37·1 × **34·1** mm.; minima **43·1** × 32·3 and 44·0 × **21·3** mm.

Habits. The Sociable Plover is very much like the Lapwing in flight, food etc. but it is said to be much less shy and much easier to approach in the breeding-season. During this time it indulges in the same curious tumbling evolutions in the air but its call instead of being like the Lapwing's mewing wail is a loud, harsh, single note. On migration it assembles in very great numbers but in India it will only be found in small flocks. In Winter it is not uncommon in the North-West, ranging as far as the Southern Bombay Presidency in the South and East to the United Provinces and, rarely, Western Bengal. It keeps entirely to open country and to cultivated, or semi-cultivated, tracts rather than stony or sandy wastes and deserts.

(2123) Chettusia leucura.

THE WHITE-TAILED LAPWING.

Charadrius leucurus Licht., in Eversm., Reise. av. Oenb. nach. Buchara, p. 137 (1823) (Kuwan).
Chettusia leucura. Blanf. & Oates, iv, p. 233.

Vernacular names. None recorded.

Description. Upper plumage light brown, suffused with a purple pink, except on the head and hind-neck; forehead and indistinct supercilia pale greyish-white; upper tail-coverts and tail pure white; median and greater wing-coverts with broad black bars and white tips forming four wing-bars; primaries black; outer secondaries white, with broad black bars gradually decreasing until the central feathers are white and thence grading into the innermost, which are like the back; chin, throat and fore-neck ashy-grey; breast purer grey; abdomen, vent and under tail-coverts rosy-white or rosy-buff; axillaries white.

Colours of soft parts. Iris brown or blood-red; bill black; legs pale yellow.

Measurements. Wing 169 to 178 mm.; tail 73 to 78 mm. tarsus about 72 to 77 mm.; culmen 28 to 31 mm.

Young birds have the upper parts very dark brown, the feathers with broad fulvous edges; the underparts like the adult but pale and looking very washed out.

Distribution. Breeding throughout Mesopotamia, Persia, Turkestan and Transcaspia. In Winter South to India and North Africa.

Nidification. The White-tailed Plover breeds in large colonies in Mesopotamia whereever there are extensive swamps or lakes. Pitman found one colony of some hundreds of pairs breeding at Museyib in the Euphrates Valley. Here they were making their nests, the usual Plover's scratching unlined or lined with grass, weeds or small shells etc., either at the edge of the swamps or in the numerous little islands. So many were the birds that often on islands of a few feet across four or five pairs were breeding together. The eggs were either three or four in number, three as often as four and, in appearance were like small dull-coloured Plovers' eggs, rather narrow and less peg-top in shape than most Peewits' eggs. In the majority the ground-colour is a pale dull clay, in a few more olive-grey. The markings consist of fairly bold blotches and spots of blackish- or reddish-brown, the secondary marks of lavender, few or absent altogether. Eighty eggs average 39·5 × 28·3 mm.: maxima **43·2** × 29·0 and 41·3 × **29·2** mm.; minima **37·5** × 28·1 and 38·8 × **27·0** mm.

The breeding-season is from the middle of May to the middle of June but Cox and Cheesman took some eggs in July, possibly second layings, as many of the early nests are lost in floods.

Habits. The White-tailed Plover is common in the Punjab, Sind, Rajputana and most of Northern India, straggling South to Mysore and East to Calcutta and Dacca, from which latter place I have seen specimens. It is essentially a marsh-loving bird and will not be found any distance from large swamps and lakes but otherwise it is much like the Peewit in flight, food and its actions generally. It occurs in fairly large flocks in Sind and the Punjab but only as odd stragglers in the extreme East and South of its wanderings. Pitman says that it is a very noisy bird and the colonies create a tremendous outcry when disturbed in their breeding-haunts.

Genus HOPLOPTERUS.

Hoplopterus Bonaparte, Geom. Arcad. Rome, xlix, p. 55 (1831).

Type by mon., *Charadrius spinosus* Linn.

This genus is distinguished by possessing a long, curved spur on the bend of the wing; the wing is rounded, the second primary longest; the tarsus is long, slender and reticulated throughout; there is no hind toe.

(2124) Hoplopterus ventralis.

THE SPUR-WINGED PLOVER.

Charadrius ventralis Wagl., Syst. Av., no. ii (1827) (Calcutta).
Hoptoplerus ventralis. Blanf. & Oates, iv, p. 229.

Vernacular names. None recorded.

Description. Whole crown and full crest to the nape, lores, chin, throat and cheeks black bordered with white; hind-neck vinous-grey, passing into light brown on the back, rump, scapulars, inner coverts and inner secondaries; upper tail-coverts white; tail white at the base, black on the terminal half, the outer tail-feathers narrowly tipped with white; primary coverts and primaries black, the bases of the latter white, this increasing in extent until the central secondaries are pure white; outer lesser wing-coverts black; median and greater coverts white; upper breast almost white, shading into vinous-grey on the sides of the neck and browner grey on the lower breast; centre of abdomen black; remainder of underparts white.

Colours of soft parts. Iris dark brown; bill black; legs and feet horny-brown to reddish-black.

Measurements. Wing 185 to 205 mm.; tail 88 to 94 mm.; tarsus about 64 to 67 mm.; culmen 26 to 28 mm.

Distribution. Practically the whole of Eastern India as far West as, and including, the Central and United Provinces; Assam, Burma, the Indo-Chinese Countries and South China. In the North-West it extends to the foot-hills of Garhwal and Kashmir.

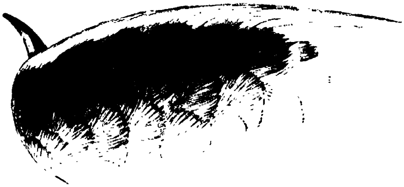

Fig. 30.—Wing-spur of *H. ventralis*. 1/1.

Nidification. The Spur-Winged Plover breeds both on the bigger rivers and the smaller streams running far into the hills. The hollow scratched for the eggs may be either in shingle or in sand, whilst very often the eggs are laid on rocks or among quite large boulders where a little sand or small shingle has lodged. Undoubtedly the birds prefer shingle and rocks to sand but occasionally they may be found breeding in open marshlands among Terns and Pratincoles. The normal clutch of eggs is four, though in some areas three only is quite common. They are very like the eggs of *Lobivanellus* but, on the whole, duller and more grey or olive-brown in general tone as well as rather more long in shape. The ground-colour is pale stone-yellow, dull grey-brown, or buff, rarely at all warm or bright. The markings consist of blotches, spots and smudges of blackish with others of lavender underlying and inconspicuous. It is exceptional for the markings to stand out at all boldly in contrast to the ground. The average of one hundred eggs is 41·1 × 29·4 mm.: maxima **46·1** × 30·0 and 42·0 × **31·7** mm.; minima **38·1** × 29·0 and 39·0 × **28·0** mm.

The breeding-season is from the middle of March to the middle of April.

Habits. The flight, walk and general actions of this Plover are very like those of the Peewit but this bird keeps entirely to streams, running about on the shingle and sand and every now and then flapping slowly away to a fresh feeding-ground. Its call is a loud and most persistent "Did-he-do-it, Did-he-do-it," finishing up with "Yes he did." Young and old swim well.

Genus LOBIVANELLUS.

Lobivanellus Strickland, P. Z. S., 1841, p. 33.

Type by orig. desig., *Parra goensis* Gmelin = *Tringa indica* Bodd.

This and the next two genera are distinguished by having curious fleshy wattles in front of the eye, whilst in this and the next there is a small hind toe present. The bill is of moderate length, the culmen flattened at the base and the dertrum slightly swollen; the linear nostrils are placed in grooves extending over more than half the length of the upper mandible; the wing is long, with the second primary longest in both sexes and it is furnished with a spur at the bend; the tail is almost square; the tarsus is long and reticulated throughout.

Lobivanellus indicus.

Key to Subspecies.

A. A white band down each side of the neck to the breast.	
a. Slightly darker and with more purple gloss	*L. i. indicus*, p. 186.
b. Slightly paler and with less purple gloss	*L. i. aigneri*, p. 188.
B. A white band from eye to ear-coverts only lower neck black all round	*L. i. atronuchalis*, p. 189.

(2125) Lobivanellus indicus indicus.

THE INDIAN RED-WATTLED LAPWING.

Tringa indica Bodd., Pl. Enlum., p. 50 (1783) (Goa).
Sarcogrammus indicus. Blanf. & Oates, iv, p. 224.

Vernacular names. *Titiri*, *Titai*, *Titi*, *Tituri* (Hind.); *Titavi* (Mahr); *Yennapa Chitawa* (Tel.); *Al-kati* (Tam.); *Kiralu*, *Kibulla* (Cing.); *Balighora*, *Teta-tua* (Assam).

Description. A broad white band from the eye, including the ear-coverts, passing down the side of the neck and joining the white of the lower breast, abdomen, vent and under tail-coverts;

remainder of head, fore-neck and breast glossy black; back, scapulars and innermost secondaries olive bronze-brown, with a purple gloss on the lesser and median wing-coverts; lower back darker brown; rump, upper tail-coverts and tail white, the last with a broad subterminal black bar, the central feathers with brown tips and a brown margin to the black band; primaries and outer secondaries black, the secondaries with broad white bases, which increase until the central rectrices are all white; primary coverts black; greater coverts white with concealed black bases; axillaries white.

Colours of soft parts. Iris red to red-brown; bill-tip black, the rest red or orange-red; eyelids and wattle crimson-red; legs bright yellow.

Measurements. Wing 212 to 233 mm.; tail 107 to 116 mm.; tarsus about 79 to 89 mm.; culmen 32 to 34 mm.

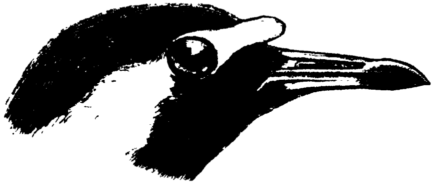

Fig. 31 —Head of *L. i. indicus.* $\frac{2}{3}$.

Young birds have the black feathers of the head broadly fringed with brown; the chin, throat and fore-neck are white and the sides of the neck not so pure a white as in the adult.

Nestling in down. Upper parts grizzled grey-brown, white and a little rufous; there are well-marked central and lateral coronal black streaks, a big black patch on both sides of the anterior crown, meeting behind; a well-marked dorsal line and two short black thigh-lines; sides of head and neck white; throat and fore-neck black; remaining underparts dull white.

Distribution. The whole of India and Ceylon except Sind, Mekran and the Baluchistan frontiers on the West and Assam South of the Brahmapootra and extreme Eastern districts of Bengal, North-East of the Bay of Bengal.

Nidification. The Red-Wattled Lapwing breeds principally in April, but many birds lay during March and others during May, June and July, though these latter are almost certainly birds which have lost their first eggs. They breed throughout the area they inhabit in the plains, whilst in the hills of Southern India they have been recorded at 5,500 feet and in the Himalayas up to about 5,000 feet or, very rarely, 6,000 feet The nest is the usual scratching made in the sand, soil etc. by the birds and the most common site is, perhaps, on shingle- and sand-beds in rivers. Often, however, they lay at a considerable distance from water in waste land, fallow or ploughed fields, whilst in some districts the birds lay in numbers on the ballast on railway lines, so close to the rails that the rail-boards of the carriages actually pass over the nests. Four eggs are invariably laid which are like those of the Spur-winged Plover but often more boldly and handsomely marked. One hundred eggs average 42·1 × 29·8 mm.: maxima **45·8** × 31·0 and 43·4 × **32·2** mm.; minima **39·3** × **28·0** mm.

Habits. The "Did-he-do-it" or "Pity-to-do-it" Bird, as it is called by Europeans, is a very familiar bird to most people in India, its noisy call, which these names imitate, calling attention to itself wherever it may be. Its flight is like that of the Lapwing, generally a slow flapping, showing all sorts of contortions during the breeding-season and capable of considerable speed when required. Certain of the smaller Hawks used formerly to be specially trained to hunt this bird, its wonderful powers of twisting and turning in the air making it a difficult quarry to bring down. Its food consists of worms, grubs, insects of all kinds as well as freshwater mollusca, tiny crayfish etc. It is resident wherever found, though it may move about locally under food and weather conditions whilst it seems to desert the higher hills in Winter.

(2126) Lobivanellus indicus aigneri.

THE MEKRAN RED-WATTLED LAPWING.

Sarcogrammus indicus aigneri Laubm., 'Falco,' Aug. 1913, p. 30 (Mekran).

Sarcogrammus indicus. Blanf. & Oates, iv, p. 224 (part.).

Vernacular names. *Tatihar* (Mesopotamia).

Description. This race is slightly paler on the upper parts than the typical form and has less gloss both on the back and on the wings. The differences in colour are, however, very slight and there are exceptional specimens from both Mekran and Mesopotamia with as much bronze-green gloss on the back and purple gloss on the wing-coverts as on any Indian bird.

Colours of soft parts as in the other races.

Measurements. Wing 221 to 240 mm., one 213 mm.; culmen 31 to 35 mm. (*Ticehurst*). In the British Museum series the wing runs from 228 to 240 mm.

Distribution. Mekran, Sind, the extreme North-West Frontier close to Baluchistan and Afghanistan, roughly the Trans-Indus area. The whole of Mesopotamia and South-West Persia.

Nidification. This Lapwing breeds throughout its area from Sind to Northern Iraq, making the usual scratched-out hollow for its eggs at some distance from water in any kind of open country. In Iraq, Ticehurst says it breeds from mid-April to June but in

Sind March and April are the principal breeding months. The eggs cannot be distinguished from those of the preceding race.

Habits. Except that it frequents more arid and desert country, very much the same as the habits of the other races.

(2127) Lobivanellus indicus atronuchalis.

THE BURMESE RED-WATTLED LAPWING.

Lobivanellus atronuchalis (Blyth), Jerdon, B. of Ind., iii, p. 648 (1864) (Burma).

Sarcogrammus atronuchalis. Blanf. & Oates, iv, p. 224.

Vernacular names. *Titidu* (Burm.); *Dao-dugip* (Cachari).

Distribution. Differs from the two preceding races in having the white line down the side of the neck restricted to a patch on and just behind the ear-coverts, leaving the whole neck black all round; the black neck is divided from the green back by a narrow white or lilac band.

Colours of soft parts as in the other races.

Measurements. Wing 200 to 221 mm.; culmen 27 to 32 mm.

Distribution. Assam, South of the Brahmapootra, Tippera, Chittagong, Burma and Malay States to Sumatra and the Indo-Chinese Countries.

Nidification. Similar to that of the other races. In the hills of Assam this bird breeds up to some 2,000 feet wherever there are streams with shingle- or sand-banks suitable for its nesting and to these it keeps entirely. In the plains, on the other hand, it breeds more often in open land, preferably fallow-fields and open waste land. Very often only three eggs are laid. The eggs are quite indistinguishable from those of the Indian bird. Thirty-six average 41·5 × 29·8 mm.: maxima **45·4** × 30·1 and 45·0 × **31·1** mm.; minima **40 1** × 28·4 and 40·4 × **28·1** mm.

The breeding-season is from March to June, most eggs being laid in April.

Habits. Those of the species.

Genus LOBIPLUVIA.

Lobipluvia Bonaparte, Comp. Rend. Acad. Sci. Paris, xliii, p. 418 (1856).

Type by mon., *Charadrius malabaricus* Boddaert.

In this genus the bill is more slender than in *Lobivanellus*, whilst the tarsus, which is long and slender, instead of being reticulated throughout, has transverse shields in front. There is no hind toe in this genus. Second primary generally longest in both sexes, first and third subequal. In one or two the first primary is longest but there appears to be no sexual difference.

(2128) Lobipluvia malabarica.

THE YELLOW-WATTLED LAPWING.

Charadrius malabaricus Bodd., Pl. Enlum., p. 53 (1783) (Malabar coast).

Sarciophorus malabaricus. Blanf. & Oates, iv, p. 226.

Vernacular names. *Zirdi* (Hind.); *Jithiri* (N.W. Provinces); *Chitawa* (Tel.); *Al-kati* (Tam.).

Description. Line between wattles on forehead and crown black, surrounded by a whitish line; back, scapulars, wing-coverts and innermost secondaries light brown; upper tail-coverts and tail white with a broad black subterminal band, absent on the outermost pair of feathers and represented by two small black patches on the next pair, central tail-feathers with brown tips and brown edge to the black band; primaries black, the first three with white inner halves to the inner webs; outer secondaries white with a black tip, this decreasing until the central secondaries are all white; greater coverts white; primary coverts black; chin and upper throat black; neck all round paler brown than the back, darkening on the breast and with a black line dividing it from the white lower breast, abdomen, flanks and under tail-coverts.

Colours of soft parts. Iris white to silver-grey or pale lemon-yellow; bill black, the base and gape yellow, or greenish-yellow; legs and feet bright yellow.

Measurements. Wing 184 to 202 mm.; tail 80 to 89 mm.; tarsus about 55 to 61 mm.; culmen 26 to 28 mm.

Young birds are pale sandy-brown above, narrowly barred with rather darker brown; chin albescent, throat and upper breast pale brown with faint traces of darker brown marks.

Distribution. All India and Ceylon, as far North-West as Lower Sind but not in Upper Sind or the Trans-Indus area. East it extends as far as Calcutta and Dacca.

Nidification. The Yellow-wattled Lapwing breeds from March to the end of June, laying three or four eggs in a depression scratched in the soil by the birds themselves. The site is always one in open country, fields, barren land, semi-desert or even ploughed fields but, preferably, not far from water. In the Southern Bombay Presidency, Malabar and Travancore they are extremely common and here Mr. J. Stewart found them breeding in great numbers along the coast-line, round about the lakes and also all along the strip of open laterite country which runs down parallel with the same coast. The eggs of this bird form one of the most startling instances of adaptation to environment. The common type of egg laid all over India is merely a small edition of the eggs of *Lobivanellus* and *Hoplopterus* but all along the strip of red laterite soil, extending for many miles North and South, the ground-colour of the eggs is a bright brick-pink, exactly the same in colour as that of the soil on which they are laid, the bold black specks and spots resembling the black nodules which lie scattered everywhere on the red laterite. Stewart found that practically without exception the dark eggs were laid on dark soil, whilst the red ones were deposited on the red laterite. Eggs which were laid on the wrong soil showed up in startling contrast to it and could not long escape the eyes of the vermin which swarm everywhere in India. On the contrary, the red eggs were so invisible on the red soil that it was not until Stewart instituted an organised search for them that he had any idea how common they were, though so difficult to find. Two hundred eggs average 36·4 × 26·9 mm.: maxima **42·8** × **26·0** and 37·0 × **28·5** mm.; minima **32·0** × **24·4** mm.

Habits. This Lapwing keeps much to dry and open land and, though it is more common on the Malabar coast than anywhere else, even there it keeps to the drier areas and is not to be found in the heavily-forested country. The vicinity of water does not seem a necessity and it seldom or never haunts the beds of streams like the Red-wattled and Spur-winged Plovers so often do. In flight, food and voice it is very similar to the Red-wattled Lapwing.

Genus MICROSARCOPS.

Microsarcops Sharpe, Cat. B.M., p. 133 (1886).

Type by mon., *Pluvianus cinerea* Blyth.

This genus is very close to the preceding but has a small hind toe. There is a lappet as in that genus and the long, slender tarsi are reticulated behind and scutellated in front.

The genus contains but one species which summers from Mongolia to Japan, migrating to India in the cold weather.

(2129) Microsarcops cinereus.

THE GREY-HEADED LAPWING.

Pluvianus cinereus Blyth, J. A. S. B., xl, p. 587 (1842) (Calcutta); Blanf. & Oates, iv, p. 228.

Vernacular names. None recorded.

Description. Upper plumage from forehead to lower back light brown, the forehead almost or quite pure grey and the head to the nape washed with grey; wing-coverts edged paler and greyer; rump, upper tail-coverts and tail white, with a broad black subterminal bar, almost disappearing on the outermost feathers and bordered with brown on the central ones; primary coverts and primaries black; greater secondary coverts and secondaries white; chin albescent; whole neck and upper breast ashy-grey, terminating in a broad chocolate-black pectoral band; under wing-coverts, axillaries and under tail-coverts white.

Colours of soft parts. Iris red; bill yellow with the terminal third black; eyelids and lappets yellow; legs and toes brownish-yellow or yellow; claws black.

Measurements. Wing 228 to 255 mm.; tail 93 to 112 mm.; tarsus about 75 to 79 mm.; culmen 35 to 39 mm.

Young birds have the head, neck and breast concolorous with the back and want the pectoral band.

Distribution. Breeding from Central Siberia and North-West China to Japan and Corea; wintering in Southern China, the Indo-Chinese countries, Malay States, Burma and Eastern India. Irby reported it from Oude, probably quite correctly, whilst recently Whistler saw it in Kashmir, so close that, although he did not shoot it, he is positive of its identity. In Assam and Eastern Bengal it is quite common from November to March and I have shot many in the former province. It has also occurred in the Andamans.

Nidification. Very little known. It is said to breed from the middle of May to the end of June in marshy places, laying three or four eggs in a hollow in some dry tuft of grass. The only two clutches in my collection, one from Corea and one from Echo in Manchuria, seem very small for this bird but may be quite correct. They are indistinguishable from the common Lapwing's eggs, one being a boldly-blotched set on a pale ground, the other a very brown set marked with dull black. Eight eggs average 41·3 × 32·0 mm.: maxima **49·6** × **34·0** mm.; minima **41·0** × **30·0** mm.

Habits. Apparently much the same as those of the Common Lapwing. They appear in Eastern India about the end of October, never in flocks but singly or in pairs, disappearing again before the end of March. In Assam they haunt marshy places and we generally found them on the edge of swamps when snipe-shooting. Their cry is a plaintive "chee-it, chee-it," seldom uttered in the non-breeding season.

Genus HIMANTOPUS.

Himantopus Brisson, Ornith., i, p. 46; v, p. 33 (1760).

Type by taut., *Charadrius himantopus* Linn.

In this genus the most remarkable character is the great length of the legs, the tibia being very long as well as the tarsus and bare over about three-quarters of its length; the tarsi are reticulated throughout; there is no hind toe and the outer toe is joined to the middle toe by a broad web, that between the inner toe and middle toe being narrower; the bill is long, straight and slender, the dertrum not swollen; the nostrils are long slits placed in the base of a groove which runs about half the length of the upper mandible; the wing is long and pointed with the first primary longest; the tail is short and even.

Stilts are resident birds in nearly all tropical and temperate countries, one species of very wide range occurring in India.

(2130) Himantopus himantopus himantopus.

The Black-winged Stilt.

Charadrius himantopus Linn., Syst. Nat., 10th ed., i, p. 151 (1758) (Europe).
Himantopus candidus. Blanf. & Oates, iv, p. 247.

Vernacular names. *Gaj-paun*, *Tinghur* (Hind.); *Lal-Gon*, *Lal-thengi*, *Lam-gora* (Beng.); *Gusling* (Sind.).

Description.—Adult male. Mantle and wings, above and below, black, glossed with metallic green; upper tail-coverts tinged with brownish-grey; tail delicate pale grey-brown; remainder of plumage white, a few black spots often showing on the head.

Colours of soft parts. Iris bright red; bill black; legs and feet crimson-red, the claws black.

Measurements. Wing, ♂ 240 to 253 mm.; tail 80 to 86 mm.; tarsus about 115 to 145 mm.; culmen 60 to 69 mm.; wing, ♀ 227 to 236 mm.; culmen 54 to 68 mm.

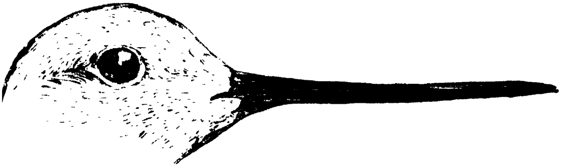

Fig. 32.—Head of *H. h. himantopus* (adult). ⅔.

Females have the back, scapulars and inner secondaries brown instead of black; the white head is nearly always sullied with some grey, whilst the hind-neck often also shows some grey.

Young males have the anterior crown, upper ear-coverts and a line down the back of the neck black.

Nestling. Upper plumage pale fulvous, mottled with black, this forming very indefinite lateral and a distinct median coronal line; there is a fairly distinct dorsal line with an arrow-head cross-line on the shoulders and extreme rump.

Distribution. Southern Europe, Africa, Central and Southern Asia to Ceylon, Malay Straits etc.

Nidification. The Stilt breeds wherever it is found, making its nest in swamps and marshes, either in or close to the water. In India a favourite breeding-place used to be the salt-works at Sultanpur, where many hundreds nested in April and May. Now the works are abandoned and the birds have left. There are also other breeding-places in Oude, Sind, Ceylon, the Sunderbands in Eastern Bengal, Burma etc. but in none of these are the birds so numerous as they were in the Delhi district. The nests vary greatly; in some cases they are substantial conical mounds of vegetable rubbish as much as two feet high, in others they are mere scrapes in the soil, lined with grass, weeds or small pebbles, or unlined altogether. The Stilt also breeds in great numbers in Iraq, where Pitman found some hundreds of nests in the Euphrates Valley in June. In Ceylon they breed during April and May in the South, during June, July and August in the North. The full clutch of eggs is four, very rarely three or five. The ground-colour varies from a pale yellow or yellow-grey stone-colour to a warm brown, the markings consisting of large and small black blotches, generally more numerous at the larger end. Jourdain gives the average of 100 European eggs as 44·0 × 31·0 mm.: maxima 48·2 × 33·0 mm.; minima 38·0 × 28·0 mm.

Habits. The Stilt is a resident bird but moves locally according to food-supply and water. It is very sociable, nearly always being found in large flocks, is not shy and is very noisy. Its flight is easy and fairly fast but its very long, thin legs trailing out behind give it a rather grotesque appearance. It walks slowly and sedately but can run at some speed and it swims well. Its food consists chiefly of aquatic and other insects, small mollusca and tadpoles, fish-fry, frog-spawn and, occasionally, small frogs and lizards.

Genus RECURVIROSTRA.

Recurvirostra Linn., Syst. Nat., 10th ed., i, p. 181 (1758).

Type by mon., *Recurvirostra avocetta* Linn.

In this genus the bill is very long, flexible, curved upwards towards the tip, depressed and with both mandibles flattened; the nostrils are placed near the base in an ill-defined groove, which extends over less than half the upper mandible; the tarsi and tibia are long and bare, the former reticulated; there is a small hind toe and claw and the anterior toes are deeply webbed, the webs notched in the middle; the wing is long, the first primary longest.

As in the preceding genus, *Himantopus*, the value of the differences in these birds has been considered from various points of view by different systematists, some considering them merely of subspecific value, whilst others consider them to be not only specific but generic. One species, the type of the genus, occurs in India.

(2131) Recurvirostra avocetta avocetta.

THE AVOCET.

Recurvirostra avocetta Linn., Syst. Nat., 10th ed., i, p. 151 (1758) (Europe, Oland); Blanf. & Oates, iv, p. 248.

Vernacular names. *Kusya Chaha* (Behar).

Description. Upper part of head and neck, scapulars and a line over the shoulders in continuation, median wing-coverts and inner secondaries and primaries black; the longest secondaries greyish at the ends; the inner primaries with white bases; remaining plumage white.

Colours of soft parts. Iris red-brown to red; bill black; legs and feet pale bluish-grey.

Measurements. Wing 220 to 235 mm; tail 86 to 90 mm.; tarsus about 84 to 90 mm.; culmen 84 to 91 mm. (*Hartert*).

In Winter the tail is greyish, the long secondaries more grey and less black.

Young birds have the black replaced by brown, the brown scapulars, coverts etc. edged with paler brown, giving a mottled appearance.

Nestling in down. Above pale grey; a black line through the lores and another down the centre of the crown with other black marks laterally; two broken dorsal lines of black and a well-developed black line down the posterior flanks joining round the tail; a few black blotches between this last and the dorsal lines; below dull white.

Distribution. Breeding over the greater part of Europe; the Black Sea and Caspian Sea to the Yenesei; Tropical Africa and South to North and Western India and Ceylon in Winter.

Nidification. The Avocet breeds in Europe from the end of April to the end of May in and round marshes in colonies of some size. The eggs are laid either on the bare ground or in depressions roughly lined with vegetable débris. The eggs, four in number, are very like those of the Stilt's but with a rather browner less yellow ground-colour and much bigger. One hundred eggs average 50·5 × 35·0 mm.: maxima **55·6** × 35·6 and 50·4 × **37·5** mm.; minima **46·8** × 34·3 and 48·3 × **31·2** mm. (*Jourdain*).

Habits. The Stilt is to some extent migratory, the Northern birds moving South in Winter to North Africa, Palestine, Mesopotamia, Persia and India. It occurs in India in small flocks commonly in the North-West, rarely as far South as Ceylon and East to Behar. It keeps to marshy land, swamp and lakes, feeding on small crustacea, water insects etc., obtaining its food by sweeping in the mud and sand with a circular action of its curved bill. It walks slowly and quietly, flies well with outstretched legs and swims well and high in the water. Witherby syllabifies its call as "klweet, klweet" and says that the male also has a low "chuck, chuck, chuck, chawy," which it utters on the ground.

Genus IBIDORHYNCHA.

Ibidorhyncha Gould, Century Birds, pl. 19 (1831).

Type by mon., *Ibidorhyncha struthersii* Gould.

This very curious genus still requires considerable study before its position can be finally settled. Pending this I follow Lowe in retaining it in the *Vanellinæ.*

The bill is hard, long, slender and curved downwards over nearly half its length; the nostril is linear and is placed at the base of the bill in a groove which extends over more than half the length of the bill; the tarsi are comparatively short and reticulated throughout; there is no hind toe; the outer and middle toes are connected by a deeply-indented small web but that between the middle and inner toes is obsolete; the wing is very square, the first three primaries subequal and the inner secondaries almost as long.

(2132) Ibidorhyncha struthersii.

THE IBIS-BILL.

Ibidorhyncha struthersii Gould, Century Birds, pl. 19 (1831) (Himalayas).
Ibidorhynchus struthersi. Blanf. & Oates, iv, p. 249.

Vernacular names. *Puggah* (Hill Miri).

Description. Face as far back as the middle of the eye, throat and crown black bordered by white; the forehead and lores more or less speckled and streaked with white; neck, sides of head and upper breast bluish-grey, above merging into the ashy grey-brown of the upper plumage: rump-feathers with dark brown bases showing plainly; tail ashy-grey with narrow, wavy dark cross-bars, the outer feathers with broad blackish subapical bars; primaries rather darker brown, the inner webs marked with white, indefinite broad margins to the first three or four, becoming well-defined white spots and bases on the innermost; a narrow white band below the blue upper breast followed by a broad black gorget; axillaries, under wing-coverts and rest of lower plumage white.

Colours of soft parts. Iris crimson; bill deep crimson-red to scarlet-red; legs and feet pinkish-grey (non-breeding and young) to blood-red (breeding adults).

Measurements. Wing 230 to 245 mm.; tail 113 to 120 mm.; tarsus about 47 to 49 mm.; culmen 68 to 80 mm.

Young birds have no black and white on the head; the black breast-band is wanting or only just shows; the upper plumage has each feather narrowly margined paler.

Nestling in down. Above grey formed by the most minute stipplings of blackish and white, here and there a tinge of fulvous; a darker line round the back of the head; a well-defined black and rufous line down the posterior flanks and round the tail; below greyish-white.

Distribution. The Pamirs and Gilgit to North-West China in Winter moving down to the foot-hills all along the Himalayas. In Assam it is common in the hill-streams where they debouch from the hills but never wanders any distance into the plains. In the Himalayas it occurs principally between 9,000 and 15,000 ft.

Nidification. Whymper first discovered the Ibis-Bill breeding in the Garhwal Hills between 8,000 and 9,000 feet in April 1906; since then it has been found breeding by Osmaston, Ludlow and others in Ladak and Tibet up to an elevation of at least 13,000 feet. La Touche also obtained several nests on the Shin-ho River in North-East Chihli in April and May. In the Himalayas the favourite nesting-sites are the islands in the hill rivers where these run through wide valleys, often having several branches. Hollows are scratched out by the birds for their eggs on the ridges of the shingle-banks and are quite in the open, no concealment being attempted. They are neatly lined with small smooth pebbles collected for the purpose, those which are black being most often selected. Four eggs form the normal clutch but three only are sometimes incubated. In general appearance they are rather like pale weakly-coloured eggs of the Wood-cock; the ground-colour is very pale grey, tinted greenish, yellowish or buff and the marks consist of small blotches and spots of light to dark reddish with secondary markings of pale lavender. Both types of blotches are fairly numerous at the larger end and scant elsewhere. In shape they are broad ovals, rather pointed at the smaller end. Fifty-two eggs average 51·0 × 36·9 mm.: maxima **53·0** × 36·0 and 50·3 × **38·0** mm.; minima **46·0** × **34·0** mm.

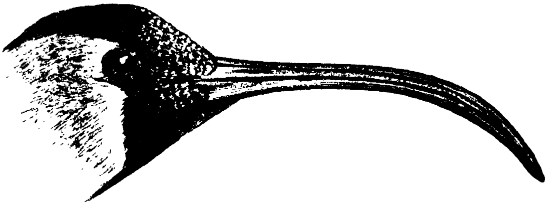

Fig. 33.—Head of *I. struthersii.* ⅗.

Habits. The Ibis-Bill keeps entirely to the banks and beds of rivers, in Summer between 8,000 and 15,000 feet or perhaps higher still and in Winter between the edge of the plains and 10,000 feet and in Tibet up to 12,000 feet, as it seems to remain on the Gyantse Plateau all the year round. Its flight is like that of the Sandpiper but not so fast, whilst during the breeding-season its contortions in the air and behaviour near the nest are said to resemble those of the Lapwing. Walking about it is a very graceful bird and it is not shy, allowing a close approach and showing no fear of being watched. It feeds on insects, mollusca and sand-hoppers and one I shot had been feeding entirely on small grasshoppers. The only note I have heard is a musical "klew klew" but it is said to have also a loud harsh call of fear.

Family SCOLOPACIDÆ.

In this family Lowe includes all those genera which, in the first edition of the Avifauna, were embraced in the two subfamilies *Totaninæ* and *Scolopacinæ*, with the exception of the one genus *Rostratala*, which I have removed from the latter subfamily and elevated to a suborder by itself.

In this family the diagnostic characters are the scutellated tarsus and nasal groove which extends over more than half the length of the upper mandible.

The family is divided further into four sub-families, *Triginæ*, *Eroliinæ*, *Phalaropinæ* and *Scolopacinæ*.

Key to Subfamilies.

A. Eyes and ear-orifices placed normally.	
a. Toes with no fringe of lobed web.	
a'. Toes partially webbed at the base ..	*Tringinæ*, p. 199.
b'. Toes divided to the base	*Eroliinæ*, p. 230.
b. Toes with a fringe of lobed web	*Phalaropinæ*, p. 247.
B. Eyes placed very far back in the head, with the ear-orifice just below the hinder edge of the orbit..............	*Scolopacinæ*, p. 251.

Subfamily TRINGINÆ.

The different genera in this Subfamily agree in having a slender, and often rather lengthened bill, well-provided with nerves. Except in *Numenius*, in which the back of the tarsus is reticulated, the tarsus is scutellated or transversely shielded both in front and behind. There is a distinct Summer and Winter plumage and the sexes are nearly always alike, except in the one genus *Philomachus*.

Key to Genera.

A. Bill long and curving downwards......	NUMENIUS, p. 200.
B. Bill straight or curving slightly upwards.	
a. Bill longer than tail.	
a'. Bill not broader at the end	LIMOSA, p. 205.
b'. Bill broader at the end and pitted ..	LIMNODROMUS, p. 209.
b. Bill not longer than tail.	
c'. Bill nearly twice as long as tarsus..	XENUS, p. 211.
d'. Bill shorter than tarsus or not much longer.	
*a*². Sexes alike.	
*a*³. Bill straight	TRINGA, p. 214.
*b*³. Bill curved upwards	GLOTTIS, p. 224.
*b*². Sexes not alike in breeding-season.	PHILOMACHUS, p. 228.

Genus **NUMENIUS.**

Numenius Brisson, Ornith., i, p. 48, v, p. 311 (1760).

Type by mon., *Scolopax arquata* Linn.

In this genus the bill is very long, slender and curved downwards over the greater part of its length; the tip of the upper mandible is blunt and projects beyond the lower mandible; the nasal orifice is linear and is placed in a groove which extends over about three-quarters the length of the bill; the legs are rather long; the tarsus reticulated except on the lower half in front, where it is covered with transverse scutellæ; the hind toe is moderate in size, the claws dilated and the toes webbed at the base; the wing is long and pointed, the first primary longest and the inner secondaries very long; sexes alike.

This genus contains the Whimbrels and Curlews, which are spread over the greater part of the world.

Key to Species.

A. Crown streaked; wing over 260 mm. ..	*N. arquata*, p. 200.
B. Crown brown with a pale median band; wing under 260 mm.	*N. phæopus*, p. 203.

Numenius arquata.

Key to Subspecies.

A. Lower parts broadly streaked; axillaries white with bold streaks of blackish....	*N. a. arquata*, p. 200.
B. Lower parts finely streaked; axillaries pure white or finely streaked with blackish	*N. a. lineatus*, p. 202.

(2133) **Numenius arquata arquata.**

THE CURLEW.

Scolopax arquatus Linn., Syst. Nat., 10th ed., i, p. 145 (1758) (Sweden).
Numenius arquata. Blanf. & Oates, iv, p. 252 (part.).

Vernacular names. *Goar*, *Goungh*, *Barra Gulinda* (Hind.).

Description. Upper plumage blackish-brown, the feathers of the head and neck with broad fulvous edges, paler and almost white on the sides of the head; mantle with the pale edges browner and assuming the shape of interrupted bars on the scapulars and inner secondaries; wing-coverts with whitish edges which also become similar bars on the great coverts; a patch of feathers above and below the eye white; lower back and rump white, the centres of the feathers with broad streaks and sometimes bars of blackish; these vary greatly; in many the sides of the rump are pure white, the black showing only as a few black streaks, at the other extreme there are birds with the whole of these parts closely barred and streaked with blackish; upper tail-coverts and tail barred blackish and pale brown, the former more black and white; primaries black with white shafts and the inner webs barred with white, these bars extending on the inner primaries to the outer webs also; chin white; throat white with tiny black striæ, gradually enlarging towards the fore-neck; neck and breast fulvous with broad black central streaks; flanks white with central streaks and cross-bars of brown; abdomen, vent and under tail-coverts white with narrow dark brown centres, always less on the middle of the abdomen and vent and sometimes absent; under tail-coverts with broader dark centres; axillaries white with narrow black bars.

Fig. 34.—Head of *N. a. arquata*. ½.

Colours of soft parts. Iris brown; bill dark brown, the basal half fleshy-brown colour; legs and feet pale grey, fleshy-grey or bluish-grey.

Measurements. Wing, ♂ 280 to 303 mm., ♀ 295 to 321 mm.; tail 106 to 121 mm.: tarsus 66 to 80 mm. culmen, ♂ 100 to 124 mm., ♀ 130 to 152 mm. (*Witherby*).

Young birds have the feathers of the upper parts edged with buff and the upper tail-coverts and rump suffused with buff, whilst the streaks on the breast and abdomen are narrower.

Nestling. Above creamy-buff, the sides of neck and fore-neck darker rufous-buff and the under surface buffy-white; a broad central streak of brown from forehead to nape; posterior crown freckled black and buff; an eye-streak dark brown; a dark brown patch on the hind-neck; two lateral bands of dark brown down the back; two patches of brown on the wings and two short blackish lines below the dorsal lines.

Distribution. Northern and Central Europe, South to Dobrugea etc. In Winter South to Africa, Madagascar and North-West India as far East as Delhi and as far South as Ceylon.

Nidification. The Curlew breeds from the middle of May in England and about a month later in the more Northern countries.

The birds either scratch for themselves a hollow or make use of a natural one in marshland, on boggy crests of hills or in sand-hills. This is almost invariably well lined with rushes, grass and weeds and well concealed by surrounding vegetation. Four eggs are laid which vary in ground-colour from pale olive, olive-grey or olive-buff to warm olive-green or buff. The markings range from small spots and blotches freely scattered over the whole surface to large, handsome markings, most numerous at the larger end, sparse elsewhere. One hundred eggs average 67·2 × 47·4 mm.: maxima **75·5** × **55·0** mm.; minima **56·2** × 44·0 and 61·0 × **43·0** mm.

Habits. The Curlew is one of the wildest and most shy of all our marsh and moorland inhabitants. In India it is fairly common in the North-West and straggles down South to Ceylon but records from Eastern India are nearly all referabte to the next race. Its haunting cry of "cur-lew, cur-lew" may be often heard far overhead at night in October as the birds migrate South but in addition to the well-known call it has a musical note, sounding rather like "what-what" and a loud screaming note when frightened or disturbed. This bird occurs with us in small flocks, feeding on the shores of lakes and in marshes or along the shores of our Western coasts. It eats almost any small living thing—insects, reptiles, coleoptera, slugs, worms and, at times, berries, seeds and seaweed.

(2134) Numenius arquata lineatus.

THE EASTERN CURLEW.

Numenius lineatus Cuvier, Règne Anim., i, p. 521 (1831) (India).
Numenius arquatus. Blanf. & Oates, iv, p. 252 (part.).

Vernacular names. *Goar*, *Goungh*, *Barra Gulinda* (Hind.); *Choppa*, *Sada Kastachura* (Beng.); *Borinda* (Sind).

Description. Differs from the preceding bird in being lighter, more fulvous, less brown above; the lower parts are streaked with much finer, paler streaks; the lower back and rump are often almost unstreaked white and are never barred as in some specimens of *N. a. arquatus*; the axillaries are pure white or very lightly streaked on the longest only.

Colours of soft parts as in the typical form.

Measurements. Wing, ♂ 280 to 297 mm., ♀ 300 to 314 mm.; culmen, ♂ 137 to 139 mm. (one Calcutta 167 mm.), ♀ 135 to 194 mm.

Distribution. From Baikalia to Kirghis Steppes and West Siberia. In Winter South to the whole of India, Burma, China, Philippines etc. In India it occurs on all the coasts commonly as far South as Ceylon and also inland wherever there are large areas of swamp and lake.

Nidification. Taczanowski describes the nest and eggs of the Eastern Curlew as indistinguishable from those of the Western bird. Smirnoff took several sets of eggs at Krasnoyarsk and Yenesei which he attributed to the Common Curlew but which must, of course, be those of this race. They were all taken in late May and on flat marshy land close to the Yenesei River but no details were given me of the nests.

Habits. Those of the species. All the records of the Curlew in Eastern India and Burma are of this race.

Numenius phæopus.

Key to Subspecies.

A. General colour paler; dark bars and streaks less heavy	*N. p. phæopus*, p. 203.
B. General colour darker; dark bars and streaks broader and more numerous....	*N. p. variegatus*, p. 204.

(2135) Numenius phæopus phæopus.

THE WHIMBREL.

Scolopax phæopus Linn., Syst. Nat., 10th ed., i, p. 146 (1758) (Sweden).
Numenius phæopus. Blanf. & Oates, iv, p. 253 (part.).

Vernacular names. *Chota Goungh*, *Chota Gulinda* (Hind.).

Description. Head dark brown, the feathers edged with whitish; on either side of the crown the white is obsolete and the dark centres form two dark brown patches, leaving a median pale coronal line and two supercilia like the forehead; a small brown patch in front of the eye; lores, sides of the head and whole neck brown, each feather with broad whitish edges; upper plumage dark brown with pale brown edges forming bars on the scapulars and inner secondaries; rump and upper tail-coverts white, marked with brown in varying degree as in the Curlew; tail light brown banded with black and the lateral feathers with white tips; lower parts white, the neck, breast, flanks and under tail-coverts streaked with brown, axillaries white with dark brown bars.

Colours of soft parts. Iris hazel and dark brown; bill dark horny-brown, fleshy-pink at the base of the lower mandible; legs and feet greenish-grey.

Measurements. Wing, ♂ 232 to 250 mm., ♀ 243 to 265 mm.; tail 87 to 99 mm.; tarsus about 50 to 61 mm.; culmen, ♂ 76 to 86 mm., ♀ 80 to 99 mm.

Young birds have the feathers of the mantle notched and edged with pinkish-buff or buff and the rump suffused with the same; the feathers of the lower back, rump and upper tail-coverts finely edged with brown.

Nestling in down. Like that of the Curlew but with central streak of buff and two broad lateral streaks of brown on the crown from the forehead to the nape.

Distribution. Breeding Northern Europe, Iceland, Greenland to Western Siberia. South in Winter to Northern Africa and the coast as far as Madagascar, Arabia and North-West India.

Nidification. The Whimbrel breeds during May and early June in similar places to the Curlew and, like that bird, lays four eggs in a scratching in the ground among the grass and heather. The eggs only differ from the Curlew's in being smaller, one hundred averaging 58·9 × 41·3 mm.: maxima **65·1** × 45·7 and 57·0 × **44·0** mm.; minima **52·0** × 41·6 and 55·3 × **36·0** mm.

Habits. Except that it is a more Northern bird than the Curlew in its breeding haunts and is said not to be nearly so shy, its habits are like those of that bird. In India it is as wary and difficult to approach as the Curlew and is equally good to eat when brought to bag. It is a common Winter visitor to West and North-West India and Ceylon but Eastern records of this species nearly all apply to the next race.

(2136) Numenius phæopus variegatus.

THE EASTERN WHIMBREL.

Tantalus variegatus Scop., Del Flor. et Faun., Insubr., fasc. ii, p. 92 (1786) (Luzon).
Numenius phæopus. Blanf. & Oates, iv, p. 253 (part.).

Vernacular names. None recorded.

Description. Differs from the preceding bird in being much darker with more brown and less white; the lower back, rump and upper tail-coverts are much more heavily barred with brown and the striations on the lower plumage heavier; the flanks and under tail-coverts are broadly barred with dark brown as well as streaked; axillaries and under wing-coverts white profusely barred with dark brown.

Colours of soft parts as in the Whimbrel.

Measurements. Wing, ♂ 231 to 239 mm., ♀ 227 to 239 mm.; tail 89 to 100 mm.; tarsus 60 to 64 mm.; culmen, ♂ 77 to 84 mm., ♀ 83 to 90 mm.

Distribution. Breeding East Siberia, migrating South in Winter te China, the islands from the Celebes to Sumatra, Indo-Chinese countries and Malay States, and casual in Burma. On the East it is found as far as New Guinea, Australia and Tasmania.

Nidification. Nothing recorded but eggs taken by Smirnoff on the Yenesei and which probably were of this race are indistinguishable from those of the typical form. They were taken on the open tundras in June.

Habits. Those of the species. This is a common Winter visitor to the Indo-Chinese countries and I saw one which had been shot in Haflang, North Cachar, in 1899 and others in the same province, Assam, in 1900 which would not allow me within shot.

Genus **LIMOSA.**

Limosa Brisson, Ornith., i, p. 48, v, p. 261 (1760).

Type by taut., *Scolopax limosa* Linn.

In this genus the bill is long and straight; both mandibles are grooved, the linear nostrils being placed near the base of the bill in the upper groove; the tarsus is moderate in length, partly shielded both in front and behind, the hind toe is well developed and there is a web between the outer and middle toes but only a rudiment of one between the middle and inner toe; the middle toe is dilated and sometimes pectinate on the outer side; the wing is long and pointed with the first * primary longest, the tail is rather short and almost even.

The genus is cosmopolitan and two species visit India in the cold weather.

Key to Species.

A. Base of tail white, terminal half black..	*L. limosa*, p. 205.
B. Tail barred black and white over the whole of the outer rectrices and most of the central	*L. lapponica*, p. 208.

Limosa limosa.

Key to Subspecies.

A. Larger; wing 210 to 240 mm.: culmen 85 to 126 mm......................	*L. l. limosa*, p. 205.
B. Smaller; wing 176 to 207 mm.; culmen 77 to 87 mm.	*L. l. melanuroides*, p. 207.

(2137) Limosa limosa limosa.

The Black-tailed Godwit.

Scolopax limosa Linn., Syst. Nat., 10th ed., i, p. 147 (1758) (Sweden).
Limosa belgica. Blanf. & Oates, iv, p. 254 (part.).

Vernacular names. *Gudéra, Gairiya, Jangral, Khág* (Hind.); *Malgujha* (Nepal); *Jaurali* (Beng.); *Tondu ulanka* (Tel.).

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* The real first primary is obsolete and so minute that it is not noticeable unless searched for carefully.

Description.—Breeding plumage. A pale rufous supercilium from the bill to the ear-coverts; forehead, crown and nape dark rufous streaked with black; lores rufous speckled with black; chin and throat whitish or pale rufous; neck all round rich rufous; back, scapulars and innermost secondaries blackish, broadly barred with pale rufous and edged with white at the tips of the feathers; lower back brownish-black; upper tail-coverts white with black tips; tail blackish, white at the base, the white narrow on the central tail-feathers, broad on the outer, all the feathers tipped whitish; innermost wing-coverts blackish next the scapulars; median and greater coverts grey-brown, bordered with white, forming a broad wing-bar on the greater coverts; primary coverts brownish-black, tipped with white; primaries dark brown, paler on the inner webs, with a wedge-shaped indistinct white mark on the first primary, becoming whiter on the succeeding primaries and at the same time restricted in extent and forming a white base to the 4th, 5th and 6th primaries; outermost secondaries blackish with white bases and white tips; intermediate secondaries brown with narrow pale edges; breast rufous, barred with black; abdomen and posterior flanks rufous, heavily barred with black and with white bases and narrow white fringes; under tail-coverts white barred with black; axillaries and under wing-coverts white.

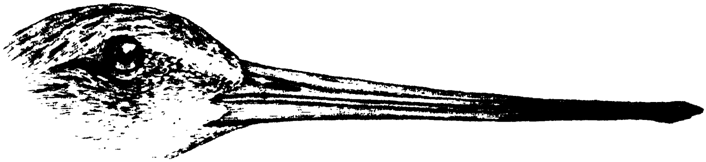

Fig. 35.—Head of *Limosa l. limosa.*

Colours of soft parts. Iris hazel or dark brown; bill dull orange-red or dusky-orange, more red at the base and dusky at the tip; legs and feet greyish-green.

Measurements. Wing, ♂ 210 to 226 mm., ♀ 215 to 240 mm.; tail 74 to 89 mm.; tarsus 75 to 82 mm.; culmen, ♂ 88 to 107 mm., ♀ 104 to 126 mm. (*Witherby*).

In Winter the upper parts are dark brown or blackish, each feather edged with fulvous; the neck more rufescent, with the dark centres obsolete; chin, throat and face pale fulvous, deepening in colour on the fore-neck and tinged with rufous-grey, thence paling to white on the abdomen and under tail-coverts.

Females are like the male but do not always assume so fully rufous a summer plumage.

Nestling down of upper parts buffy or greyish-white, grizzled more or less with brownish; crown and a line from the upper mandible light brown; a buff supercilium meeting behind the crown; a broken brown dorsal line to the uropygium; underparts greyish-white.

Distribution. Northern Europe from Iceland, Holland and Finland, Hungary and Russia to Western Asia probably as far East as Lake Baikal. In Winter South to Africa and North-West India. Common in India in the North-West and thence becoming scarcer towards the South but has occurred in Ceylon. To the East it has been obtained in the United Provinces and Western Bengal.

Nidification. In Holland the Black-tailed Godwit breeds in April and early May, both on sand-hills and the open swampy country. Elsewhere it breeds on tundras near the sea-coast and on estuaries on island coasts and marshes, making a well put together pad of weeds, rushes and grass in some natural hollow in dense short grass or other herbage. In the North many eggs are not laid until early June. The number is normally four, whilst in colour they range from pale dull olive-yellow to olive-brown with faded-looking blotches of dull brown or reddish-brown, boldly marked eggs being exceptional. In shape they are long slightly pyriform ovals. One hundred eggs (*Jourdain*) average 54·7 × 37·3 mm.: maxima **59·8** × 37·8 and 55·3 × **40·7** mm.; minima **48·5** × 37·7 and 55·0 × **34·0** mm.

Habits. In India the Godwit arrives about the first week in October and leaves again in March and April. It is generally found in small flocks feeding on the edge of tanks, lakes and marshes or on the coast. Occasionally pairs or single birds may be seen associating with other Waders but more often it is to be seen in flocks of about a dozen to fifty or even more. It feeds upon all sorts of insects, small mollusca, worms etc. but also freely on most kinds of grain and seeds and is a very good bird for the table. It flies well, is not too tame and often gives very sporting shots. Its call is syllabified by Witherby as "gr-wee-too," but in the cold weather it is a silent bird, though it generally calls when rising into the air or settling on the ground.

(2138) Limosa limosa melanuroides.

THE EASTERN BLACK-TAILED GODWIT.

Limosa melanuroides Gould, Birds of Australia, pt. xxxiv (vol. vi, pl. 38) (1846) (Port Essington, Australia).

Vernacular names. None recorded.

Description. Resembles the preceding race but differs in being rather smaller with a shorter bill. In the breeding plumage the colouring is perhaps a trifle richer, the rufous deeper and the dark bars more black, less brown.

Colours of soft parts as in the typical form.

Measurements. Wing, ♂ 176 to 197 mm., ♀ 182 to 207 mm.; tail 68 to 86 mm.; tarsus 66 to 73 mm.; culmen, ♂ 77 to 95 mm., ♀ 78 to 87 mm.

Distribution. Eastern Siberia to Japan. In Winter South to Eastern India, Burma, China, the Malay Archapelago and Australia. Exactly where the two races merge into one another is not known but probably somewhere about Lake Baikal. In Burma it is not rare in Winter and it occurs in Calcutta and Eastern Bengal, whilst numbers visit Assam yearly.

Nidification. Nothing recorded.

Habits. Quite similar to those of the preceding bird. It is a common bird both in Eastern Bengal and Assam, where I have shot great numbers for the pot, as it is excellent eating, flies with great speed and many twists and takes some stalking. It is found most often in quite small flocks but I have seen some of over 200 and once one of probably twice that number. This was in early April in Assam as the birds were migrating North. Those shot in Assam seemed to have fed more on grass-seeds and small black water-plant seeds than on insects. Their cry is a decidedly musical "tir-ree-wee," twice repeated as the birds rise and wheel in the air.

(2139) Limosa lapponica lapponica.

THE BAR-TAILED GODWIT.

Scolopax lapponica Linn., Syst. Nat., 10th ed., i, p. 147 (1758) (West Europe).
Limosa lapponica. Blanf. & Oates, iv, p. 256.

Vernacular names. Same as for *L. l. limosa.*

Description.—Breeding plumage. Crown and lores rufous with black streaks; supercilium, sides of head, whole neck, breast and under plumage rich rufous; feathers behind the eye and a line down the hind-neck streaked with black; mantle and inner secondaries rufous with broad central streaks of black, these dividing the rufous on the inner secondaries into notches; lower back, rump and upper tail-coverts white, more or less streaked with black, the longest coverts suffused with a little rufous; tail barred black and white throughout, the central tail-feathers slightly suffused with rufous; primaries black with white shafts and the 1st to 6th or 7th mottled with white on the base of the inner webs, remaining primaries black with narrow white internal edgings; outer secondaries brown-grey with white edges and a white inner streak following the contour of the feather; axillaries and under wing-coverts white with black streaks.

Colours of soft parts. Iris brown; bill pinkish flesh-colour, the terminal half horny-brown to almost black; legs and feet greenish-grey to almost black.

Measurements. Wing, ♂ 202 to 216 mm., ♀ 211 to 227 mm.; tail 66 to 77 mm.; tarsus 46 to 51 mm.; culmen, ♂ 72 to 83 mm., ♀ 95 to 106 mm. (*Witherby*).

In Winter the rufous disappears, the upper parts are brown, each feather edged with fulvous; the wing-coverts are broadly edged with pale fulvous; chin and throat albescent; fore-neck and breast fulvous-brown, with a pinky tinge and faintly streaked with darker brown, the streaks more distinct on the flanks; abdomen and under tail-coverts white or fulvous-white; the sides of the head pinkish-fulvous, much streaked with dark brown.

Females are similar to the male but do not always assume so complete a breeding plumage.

Young birds in the first autumn have the upper parts more marked with buff spots, which also form notches on the inner secondaries.

Nestling like that of the previous species but less cinnamon-pink in general tone and with the coronal and other dark marks better defined.

Description. Breeding in Northern Europe from East Finland to the Yenesei or Asiatic Siberia and probably as far East as the Taimyr Peninsula. In Winter it migrates South to Africa and the Mekran coast, Sind and Cutch in North-West India.

Nidification. The Bar-tailed Godwit does not breed so far to the West as the Black-tailed Godwit, nor so far to the South. Nest and eggs are not distinguishable from those of that bird, though the latter average smaller and are—as a whole—even duller and more smudgily marked. Fifty-one eggs (*Jourdain*) average 53·4 × 37·3 mm.: maxima **59·5** × 37·3 and 57·2 × **39·3** mm.; minima **49·1** × 36·4 and 53·0 × **35·0** mm. The breeding-season commences in the middle of June, some eggs being laid as late as the last week in July.

Habits. Much the same as those of the Black-tailed Godwit. Its call is said to sound like "low-eet, low-eet," whilst it has a musical "yodelling" love-song and its alarm-note has been likened by Miss Haviland to the sound of a scythe being sharpened on a whetstone.

Genus **LIMNODROMUS.**

Limnodromus Neuweid., Beitr. Naturg. Brasil, iv, Abstr. 2, p. 716 (1833).

Type by mon., *Macroramphus griseus* Gmelin.

In this genus the bill is like that of a Snipe, very long, straight and slender, swollen towards the tip, where it is pitted; both mandibles grooved at the sides from the base to the swollen dertrum, which has a groove on the upper surface; the tarsus is shorter than the wing and is scutellated in front, reticulated behind;

the hind toe is well developed and the anterior toes are joined by webs, that between the middle and outer being the larger; the wing is long and pointed, the first primary longest, the second almost as long. The breeding plumage is rufous, the non-breeding grey-brown, extremely like the plumage of *Limosa*. Sexes alike. Of the two species known, one is American and the other is from North-Eastern Asia.

(2140) Limnodromus taczanowskius.

The Snipe-billed Godwit.

Micropalama taczanowskia Verreaux, Rev. et Mag. Zool. p. 206, pl. xiv (1860) (Dauria).
Macrorumphus semipalmatus. Blanf. & Oates, iv, p. 257.

Vernacular names. None recorded.

Description.—Breeding plumage. Whole head, neck and lower plumage rufous; lores and a line through the eye so closely tipped with black as to appear uniformly of that colour; a line from the forehead and crown closely streaked with black, leaving a rufous line or supercilium on either side; hind-neck lightly streaked with black; mantle rufous, each feather broadly centred black, the scapulars, inner secondaries and small coverts edged with grey; lower back and rump white with black centres; upper tail-coverts barred black and white, the longer suffused with rufous: tail barred dark brown and white, the terminal brown bars blurred and broader; least wing-coverts dark brown; median and others grey-brown edged with white; quills brown with white shafts, a long wedged-shaped white patch on the inner webs on the first five and extending to both webs on the others; outer secondaries grey-brown with broad white edges; posterior flanks lightly barred with black; axillaries and under wing-coverts white with a few dark brown bars.

Colours of soft parts. Iris dark brown; bill black, paler and plumbeous at the base; legs and feet dark plumbeous or brownish-black.

Measurements. Wing, ♂ 160 to 172 mm., ♀ 163 to 177 mm.; tail 61 to 67 mm.; tarsus 48 to 54 mm.; culmen 77 to 87 mm.

In Winter the upper parts are dark rather greyish-brown, each feather edged with white, most conspicuously so on the median and greater coverts; the under plumage is white, the sides of the head, chin, throat, neck, breast and flanks speckled with dark brown, the specks becoming bars on the lower breast, flanks and under tail-coverts.

Distribution. The Snipe-billed Godwit breeds from West and Central Siberia through Mongolia to Japan. It has been obtained by Jerdon in Madras, by Blyth and Hume in Calcutta, by Oates in Pegu, McMaster at Rangoon, by Macdonad in Dibrugarh and by Wilson in Shillong, in Assam, but doubtless it occurs far more often than it is recognized and shot. Butler recorded it from the Malay States.

Nidification. Buturlin informed Dresser that he was certain that the records of the Bar-tailed Godwit breeding in the high North of the Perm and Tobolsk Governments really referred to this bird. The only eggs I have seen were sent to me by Dr. Peter Sushkin and were taken by Dr. Valizhanin in the district of Bassaul, which is situated on the Ob River, Western Siberia, at about 53·70° lat. They were taken near Kamia, a settlement of some size. These two eggs are very like dark eggs of the Godwits but have a very brown ground with very indistinct markings. They measure 47·6 × 32·3 mm. and 48·4 × 33·1 mm.

Habits. Practically nothing on record. Wilson shot one of four birds, which were together and which appeared to him to be very much like Godwits in flight and voice. In Siberia it is said to keep to the open tundras and prior to migrating to collect in very large flocks. A small flock of eight birds were seen by me in North Lachimpur, Assam, which I am sure were of this species but they would not allow me to approach within shot, flying off with a loud wailing whistle, " whee-ee, whee-ee," whenever I got within sixty yards of them. They flew, like Sandpipers, at a tremendous pace, wheeling with great suddenness every few seconds. They were busy feeding on the edge of a large swamp when first put up.

Genus **XENUS** *.

Xenus Kaup., Skizz. Entwick. Gesch. Nat. Syst., p. 115 (1829).

Type by mon., *Scolopax cinerea* Güldenstadt.

Xenus differs from the preceding genus, *Limnodromus*, as also from the next following, *Tringa*, in having the bill nearly twice as long as the tarsus and strongly curved upwards. The Summer and Winter plumages are practically the same and the former is not rufous as in the Godwits.

Both upper and lower mandibles are grooved, the long oval nostril being placed in the upper groove close to the base of the bill; the tarsus is short but longer than the middle toe and claw and is scutellated in front and behind; the hind toe and claw are well developed and the anterior toes webbed; the middle claw is dilated but not pectinated; the first primary is longest, the second nearly as long.

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* *Terekia* Bonaparte, Comp. List B. of Europe and N. Am., p. 52 (1838) is antedated by *Xenus* and cannot therefore be employed for this genus.

Xenus cinereus.

Key to Subspecies.

A. Larger and darker; culmen 44 to 53 mm. *X. c. cinereus*, p. 212.
B. Smaller and paler; culmen 35 to 44 mm. *X. c. javanicus*, p. 213.

(2141) Xenus cinereus cinereus.

THE WESTERN TEREK SANDPIPER.

Scolopax cinerea Gülden., Nov. Com. Petrop., xix, p. 473 (1774) (Caspian Sea).
Terekia cinerea. Blanf. & Oates, iv, p. 258 (part.).

Vernacular names. None recorded.

Description.—Breeding plumage. Upper plumage brown; the forehead and lores more or less streaked with white; crown streaked with blackish-brown; hind-neck less distinctly streaked; feathers of mantle with central streaks of blackish, larger and coalescing to form a fairly definite line on the scapulars; rump and upper tail-coverts mottled brown and white with brown shaft-lines; tail-feathers grey-brown, mottled with white at the tip and on the edges of the outermost feathers; primaries dark brown, the first with a white shaft; all with a paler mark on the inner webs; outer secondaries brown with broad white tips and edges; coverts grey-brown, the innermost darkest; sides of the head, chin, throat, breast and flanks dull white streaked profusely with brown; under wing-coverts, axillaries, abdomen and under tail-coverts white.

Colours of soft parts. Iris brown; bill black or dark brown, yellowish at the base; legs and feet orange-yellow.

Measurements. Wing 123 to 136 mm.; tail 51 to 59 mm.; tarsus about 27 to 31 mm.; culmen 44 to 53 mm.

In Winter the blackish streaks on the upper plumage are finer or even obsolete; the forehead and a short supercilium are almost immaculate white and the whole lower surface is pure white, sometimes faintly streaked on the sides of the neck, breast and the flanks.

Distribution. Northern Russia to Central Siberia, where it meets the next race. In Winter South to Africa, Arabia and India.

Nidification. The Terek Sandpiper breeds from Northern Russia to the Kolyma basin in Western Siberia, during late May and June. It has bred twice in Eastern Finland but is a rare breeder so far West as this. The nest is a depression in the soil or moss, generally well lined with grass, rushes or scraps of flood-wrack and, unlike most Sandpipers' nests, is generally placed under the lee of a sheltering bush, tuft of grass or other protection. The eggs, four in number, are very like those of the Marsh-Sandpiper, the ground-colour is a yellowish-grey or yellowish-buff with bold, but not very numerous, blotches of reddish- or sepia-brown and secondary markings of pale lavender. Seventy eggs (sixty-one Jourdain) average 38·5 × 26·5 mm.: maxima **42·6** × 26·3 and 39·7 × **28·0** mm.; minima **33·4** × 26·2 and 36·7 × **24·4** mm.

Habits. The Terek Sandpiper is a common Winter visitor to all the coasts and big tidal rivers of India and ascends these for hundreds of miles in Eastern Bengal, being common in Dacca and Mymensingh in some years. It generally associates in small flocks which feed on insects and also on tiny sand-hoppers and minute mollusca, a specimen I killed in Mymensingh having eaten nearly half an ounce of tiny snails, very little bigger than mustard-seeds. It may possibly be found to breed in Tibet, as I received the skin of a female, *said* to have been shot on her nest, near Gyantse, on the 9th of May, the one egg it contained being smashed by the same shot.

(2142) Xenus cinereus javanicus.

THE EASTERN TEREK SANDPIPER.

Totanus javanicus Horsf., Trans. Linn. Soc., xiii, p. 193 (1821) (Java).
Terekia cinerea. Blanf. & Oates, iv, p. 258 (part.).

Vernacular names. None recorded.

Description. Very slightly paler than the preceding form and also slightly smaller but with a distinctly smaller, more slender bill.

Colours of soft parts. Those of the species.

Measurements. Wing 122 to 135 mm.; tail 47 to 54 mm.; tarsus about 26 to 29 mm.; culmen 35 to 44 mm. (once 47 mm., possibly *L. c. cinereus*). The bill is decidedly more slender than in the typical form.

Distribution. Breeding in Eastern Siberia. In Winter migrating South to Australia, the islands of the Malay Archipelago and Burma.

Nidification. Nothing recorded.

Habits. This race is a common visitor to Burma and has been obtained as far West as Calcutta. Possibly the birds which occur so often in the Sunderbands of Eastern Bengal are nearly all of this race but the measurements of the few I have recorded seem referable to the typical form. The habits of the two races are identical.

Genus TRINGA.

Tringa Linn., Syst. Nat., 10th ed., i, p. 148 (1758).

Type by desig., *Tringa ochrophus* Linn.

Blanford included in this genus, which he called *Totanus* instead of *Tringa*, eight species of Sandpiper, but these have been separated by other systematists until every species has been relegated to a genus of its own. This system seems to defeat the very purpose of classification which has created the term genus for a *group of species* which are nearer to one another than to others which should be placed in other groups. Occasionally a species may be so aberrant as to deserve recognition of generic separation but this should be exceptional. In the present instance the only birds I separate are the two large Sandpipers with upturned bills and with large webs between the outer and middle toe and practically none between the middle and inner, the two Armstrong's Sandpipers, and the Greenshank I include in the genus *Glottis*, which is now generally recognized.

In the genus *Tringa* the bill is long, slender and straight; both mandibles are grooved, the oval nostril being placed near the base of the bill; the tip of the upper mandible is hard and bent down; the tarsus is about the same in length as the culmen or slightly longer or shorter; it is scutellated in front and behind; the hind toe is present; the outer toe is joined to the middle by a web and the inner and middle have a smaller web between them, sometimes almost obsolete.

There is little difference between the breeding and non-breeding plumage, except in *Tringa erythropus* (*fuscus* auct.), which has a very dark breeding dress.

As restricted in this work, the genus *Tringa* contains six Indian species; outside our area it is practically cosmopolitan.

Key to Species.

A. Legs olive-green or yellowish-green, never red.	
a. Intermediate in size, wing from 130 to 250 mm.	
a'. Lower back brown; tarsus a little shorter than culmen	*T. ochrophus*, p. 215.
b'. Lower back white; tarsus a little longer than culmen	*T. stagnatilis*, p. 216.
b'. Smallest in size; wing from 93 to 128 mm.	
c'. No white on rump	*T. hypoleucos*, p. 217.
d'. Rump white	*T. glareola*, p. 219.
B. Legs red. Largest in size.	
c. Outer secondaries all white	*T. totanus*, p. 221.
d. Outer secondaries barred brown and white	*T. erythropus*, p. 223.

(2143) Tringa ochrophus.

THE GREEN SANDPIPER.

Tringa ochrophus Linn., Syst. Nat., 10th ed., i, p. 149 (1758) (Sweden).
Totanus ochropus. Blanf. & Oates, iv, p. 262.

Vernacular names. *Nella ulanka* (Tel.).

Description.—Breeding plumage. Upper part and sides of head, back and sides of neck brown, each feather edged with white; mantle brown with a bronze-green gloss, spotted with white, some of the scapulars with blackish marks between the white spots; lower back and rump blackish-brown with narrow white fringes; upper tail-coverts white; tail with the concealed base white, the rest barred black and white; innermost wing-coverts and secondaries like the back; other coverts brown with the same gloss as the back; remaining wing-quills dark brown; chin, throat and whole underparts white, the fore-neck, breast and flanks streaked and barred with dark brown.

Colours of soft parts. Iris brown; bill dull greenish, black at the tip; legs and feet dull greenish-brown or olive-green.

Measurements. Wing, ♂ 135 to 150 mm., ♀ 141 to 154 mm. tail 54 to 60 mm.; tarsus 32 to 33 mm.; culmen 33 to 36 mm.

In Winter the head and hind-neck are uniform brown, sometimes with a greyish tinge; the spots on the back are smaller and very inconspicuous whilst, generally, the upper head is more grey-brown with less-developed streaks.

Young birds in the first moult have narrow bronze margins to the feathers of the upper parts; the bands on the base of the tail are narrower and the terminal band broader.

Nestling. Above deep cinnamon-pink; crown and a line from the bill black, the crown mottled with cinnamon; a black dorsal line from nape to tail-tuft; two lateral black bands on each side of this; a second lateral black line across the wings and from the wings round the uropygium; upper breast cinnamon, remaining underparts white.

Distribution. Throughout Northern Europe and Asia in the breeding-season and migrating South in Winter to Africa, India, China, the Indo-Chinese countries and Malaya.

Nidification. The Marsh-Sandpiper breeds in Northern Germany, the Baltic States etc. in April and May, whilst in the most Northern latitudes no eggs will be found until the second week in June and from that time to the middle of July. The sites selected are usually not in the open but in swampy forest or in the marshy tundras covered by stunted pine, beach and alders, where this bird lays its eggs, not in depressions in the ground like most Sandpipers, but in old nests of Thrushes, Fieldfares or Redwings. Occasionally the eggs may be deposited in well-lined hollows or in little heaps of débris but this is very exceptional. The eggs, four in number as usual, are broad peg-top ovals, with a ground-colour of pale yellowish or greenish-stone, more seldom of yellowish-buff. The marks consist of rather small specks and spots of dark reddish-brown with secondary marks of lavender. For Waders' eggs they are decidedly pale and poorly marked. One hundred eggs (eighty-two, Jourdain) average 39·0 × 27·9 mm.: maxima **42·0** × 28·0 and 41·1 × **30·3** mm.; minima **34·6** × 26·0 and 34·8 × **25·5** mm.

Habits. The Green Sandpiper is extremely common in Northern India and Northern Burma, gradually becoming less common to the South but wandering as far as Ceylon and the Malay Peninsula. It may be found wherever there is water and mud and even on the clean quick-running streams at the foot of hilly country. It is usually solitary or in pairs and may be seen running rapidly here and there after the insects on which it principally feeds, jumping into the air when disturbed, twisting rapidly as it mounts and, then, dashing off with great speed. It is a shy little bird as a rule and does not allow a very close approach but clears off uttering its musical little whistle, "twi-twi-twi."

(2144) Tringa stagnatilis.

THE MARSH-SANDPIPER.

Totanus stagnatilis Bechstein, Orn. Tasch., 2, p. 292 (1803) (Germany); Blanf. & Oates, iv, p. 263.

Vernacular names. *Chota Gotra* (Beng.).

Description.—Breeding plumage. Lores whitish; upper part of the head, neck and upper back sandy-grey, becoming a little browner on the inner secondaries and inner wing-coverts; head and neck streaked with black, the streaks becoming broader on the mantle and changing to broken bars on the scapulars and inner secondaries, the longest of which have "herring-bone" markings of black; lower back and rump white: tail pale brown, greyer at the base, with narrow bars of blackish, then decreasing outwardly until the outermost feathers merely have two narrow longitudinal lines of dark brown; primaries and outer secondaries dark brown, the latter tinged with grey and both with the inner web speckled with white and brown on two-thirds of their length; primary coverts and edge of wing black; median and secondary coverts brown-grey, narrowly edged with white; lower plumage white, the sides of the neck and head, fore-neck, breast and flanks spotted with black, the spots becoming bars on the sides of the lower breast and the flanks.

Colours of soft parts. Iris brown; bill dark horny-brown to blackish, the base of the lower mandible paler and greenish; legs and feet dull sage-green, olive-green or bluish-green.

Measurements. Wing, ♂ 131 to 138 mm., ♀ 133 to 143 mm.;

tail 56 to 66 mm.; tarsus 48 to 58 mm.; culmen, ♂ 36 to 39 mm., ♀ 40 to 45 mm. The supposed form *horsfieldi* is not any smaller than typical *glareola* and cannot possibly be separated.

In Non-breeding plumage the forehead, short supercilium, sides of the head and lower plumage are unspotted white; the upper surface is much darker and browner, the shafts showing just a trifle darker, whilst the hinder crown and neck nearly always show a few dark streaks; the sides of the upper breast are generally more or less marked with brown.

Distribution. South-Eastern France, South Russia and the Southern Baltic Provinces and Western Asia to Central South Siberia and Turkestan, Dauria and East to Mongolia. In Winter it migrates South to Africa, Palestine, Arabia, India, Burma, Malaya, South China and Australia.

Nidification. The Marsh-Sandpiper breeds from the end of April to early June, making a well-lined nest in some natural hollow in among short thick grass on the edge of swamps and marshes. The nest is always very well hidden and the birds sit close, only rising at the last moment with a zig-zag motion like that of a Dunlin. Sometimes they feign a wound and stagger across the ground with one wing dragging, trying to lead an intruder away from the vicinity of the nest. The eggs, as usual four in number, are handsome, having a pale stone or fawn to buff ground-colour with bold blotches of chocolate-brown or blackish disposed principally at the larger end with sparser secondary blotches of pale pinkish-lavender. Forty-eight eggs (thirty-four, Jourdain) average 38·5 × 27·1 mm.

This bird used to breed in great numbers in Hungary but so many of the marshes have been reclaimed that it has become a scarce breeding-bird in that country.

Habits. This little Sandpiper is not so much of a sea-shore bird as most of its family, keeping much to inland lakes and swamps, where it feeds on insects, small mollusca, small worms and coleoptera. In its actions it is like other small members of the genus but in colour-pattern it is very like the birds of the genus *Glottis* and further research may necessitate its transfer to that genus. Its bill, moreover, is not absolutely straight, though its curve upwards is hardly discernible.

(2145) Tringa hypoleucos.

THE COMMON SANDPIPER.

Tringa hypoleucos Linn., Syst. Nat., 10th ed., i, p. 149 (1758) (Sweden).
Totanus hypoleucus. Blanf. & Oates, iv, p. 260.

Vernacular names. *Polte ulanka* (Tel.); *Kotan* (Tam.).

Description. White upper parts and tail brown faintly tinged with olive; the feathers from the forehead to the lower back with fine dark central streaks, broadest on the back and scapulars; feathers from lower back to upper tail-coverts, scapulars, inner secondaries and wing-coverts with narrow pale rufous edges and sub-edges of black, most conspicuous on the wing-coverts; central tail-feathers like the back, outer tail-feathers barred black and white, intermediate tail-feathers intermediate in colour; primaries brown, the first white-shafted, the third and following primaries with a patch of white on the inner web; outer secondaries white, the outermost with broad subterminal blackish bands, disappearing on the central feathers; inner secondaries like the back; greater coverts dark brown, tipped with white and the outer edged with white also; chin and throat white; fore-neck and upper breast white with dark streaks and some brown on the sides of the breast; axillaries and remainder of lower plumage white.

Colours of soft parts. Iris brown; bill horny-brown or grey-brown, darker at the tip; legs and feet pale dull green.

Measurements. Wing 99 to 119 mm.; tail 50 to 58 mm.; tarsus about 22 to 25 mm.; culmen 23 to 26 mm. Extreme Western birds have a wing 99 to 112 mm.; extreme Eastern 102 to 111 mm.

In Winter the upper surface is more uniform, the head and hind-neck often immaculate; the general tint is also rather more olive.

Nestling in down. Upper parts darkish cinnamon-buff; a line from the upper mandible and the crown blackish and a black line through the eyes meeting behind the crown; centre of nape blackish owing to the black bases of the down showing through the buff tips; a black dorsal line from nape to uropygium; two fainter lateral bands on the sides of the back and black bands on the wings; lower plumage white, the breast suffused with buff.

Distribution. Breeding throughout the greater part of Europe to Western Siberia and thence East to Japan and South to Kashmir and Tibet. Mathews accepts *T. h. aurita* * as a good race on the grounds that it is smaller and paler. I can find no difference in the size in any special geographical area, nor can I see that Eastern birds are any paler than Western and I therefore consider *aurita* to be merely a synonym of *hypoleucos*.

Nidification. The Common Sandpiper breeds in some numbers in Kashmir, Garhwal and Kumaon from early May to the end of June. The site selected is generally among boulders and rocks on, or close to, some hill-stream but, at other times, they build in grass and weeds and at others again on shingle- or sand-beds in the stream. Sometimes the nest is well made, a good pad of grass, roots etc. and very carefully concealed, at other times there is nothing but a hollow scratched among the pebbles, no lining and no attempt at concealment. It is said to lay its eggs occasionally in the deserted nests of other birds but no such occurrence has been recorded in India. The eggs are normally four in number but one year, when perhaps food was exceptionally abundant, Col. K. Buchanan took several nests containing five and six eggs. One hundred Indian eggs average 38·9 × 26·2 mm. as against 36·4 × 25·9 mm. in one hundred European eggs (*Jourdain*): maxima **40·0** × 26·9 and 39·0 × **27·7** mm.; minima **32·1** × 26·3 and 32·2 × **24·1** mm. In colour the eggs are pale yellowish-stone or buff, occasionally a fairly warm buff, marked with reddish-brown, generally in blotches, sometimes in small specks, with underlying marks of lavender and pinkish-grey.

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* *Tringa aurita* Latham, Ind. Orn., Suppl., p. lxvi (1801) (Java).

Habits. Both in Europe and Asia this bird haunts moors and marshes or the borders of mountain-streams and rivers. In the plains it is very common in the rice-fields, whilst in the Andamans it haunts the sea-shores and is equally common. It is a most active little bird on the wing and on foot, constantly moving about, except in the hottest hours of the day. Its call is a shrill but not unpleasant "twit, twit," generally uttered as it rises and it has a very pretty trilling love-song which it warbles in the air. It feeds on all sorts of insects, freshwater mollusca, worms, grubs, beetles etc.

(2146) **Tringa glareola.**

THE WOOD-SANDPIPER.

Tringa glareola Linn., Syst. Nat., 10th ed., i, p. 149 (1758) (Sweden).
Totanus glareola. Blanf. & Oates, iv, p. 261.

Vernacular names. *Chupka, Chobaha, Tútwari* (Hind.); *Chinna ulanka* (Tel.).

Description.—Breeding plumage. A narrow supercilium and round the eye white; a streak through the eye brown; upper plumage very dark brown, the feathers of the crown and hind-neck streaked with white; elsewhere spotted with white on the edges of the feathers, narrowly edged at the tip with whitish and with the terminal portion almost black; upper tail-coverts white, some of the longest sometimes streaked with brown; tail banded dark brown and white, the brown in excess on the central, the white on the outermost, feathers: primaries, primary coverts and greater coverts blackish: outer secondaries and their coverts lighter brown, with very fine edges of white soon lost by abrasion; sides of head and neck white, spotted and streaked with dark brown; chin and throat immaculate white: breast and flanks white, profusely spotted and barred with brown; remainder of lower parts white, the axillaries barred and the under tail-coverts streaked and barred with brown.

Colours of soft parts. Iris hazel to dark brown; bill blackish, the base paler horny-green; legs and feet pale sage-green or olive-green.

Measurements. Wing 117 to 125 mm.; tail 45 to 50 mm.; tarsus 36 to 41 mm.; culmen 26·5 to 30 mm. The sexes are alike in size.

In Non-breeding plumage the white spots and black markings are not so well-defined; the fore-neck and breast are a sullied pale brown, indistinctly streaked with darker.

Tringa totanus.

Scolopax totanus Linn., Syst. Nat., 10th ed., i, p. 145 (1758).

Type-locality: Sweden.

In 1926 Meinertzhagen, reviewing this species (Bull. B. O. C. xlvi, March 29, 1926), came to the conclusion that the race from Ladak named *eurhinus* by Oberholser was not separable from the typical form and he then proceeded to give a name to a form, the type from the Kuku Nor (♀, April) as *Tringa totanus terrignotæ*. An examination of the material in the British Museum and of some specimens lent me by Messrs. Whistler and Osmaston show that Meinertzhagen is right and that the Ladak and Tibet breeding-birds cannot be separated from one another though they are both very different from his bird from the Kuku Nor. We have therefore this extraordinary distribution arising. The European bird seems to work Eastwards through Siberia, keeping North, another stream works South into the Himalayas, whilst between the two there is sandwiched another race breeding in the Altai, Kuku Nor, Tianschan and probably a considerable area in Central Asia.

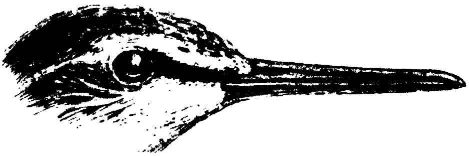

Fig. 36.—Head of *T. glareola*. 1/1.

I can see no difference in size between Ladakan and Tibetan birds and those from Europe, so *eurhinus* becomes a synonym of *totanus*. Fifty specimens of the former have wings from 152 to 164 mm. and fifty of the latter wings from 150 to 168 mm.; the culmens respectively measure 42 to 47 and 40 to 49 mm.

Key to Subspecies.

A. Much darker above and much less suffused with rufous	*T. t. totanus*, p. 221.
B. Much paler above and the upper plumage strongly suffused with rufous	*T. t. terrignotæ*, p. 222.

(2147) Tringa totanus totanus.

The Redshank.

Scolopax totanus Linn., Syst. Nat., 10th ed., i, p. 145 (1758) (Sweden).
Totanus calidris. Blanf. & Oates, iv, p. 264 (part.).

Vernacular names. *Chota Batan* (Hind.); *Mali-kotan* (Tam.); *Maha-matuwa* (Cing.).

Description. Upper plumage dark brown, the feathers of the crown and neck edged with fulvous, the inner secondaries and scapulars with bars of black and notches of fulvous; wing-coverts much barred black and rufescent white; lower back and rump white; upper tail-coverts white barred with brown; tail barred pale rufous and brown, the lateral tail-feathers white and brown; primaries dark brown, the first with a white shaft, inner primaries mottled with white on the inner webs and tips; outer secondaries pure white, the latter mottled with brown on the inner webs; chin and throat white; sides of head, neck, breast and flanks white streaked with brown, varying much in extent; centre of abdomen and axillaries pure white; under tail-coverts white streaked with blackish.

Colours of soft parts. Iris brown; bill black, reddish on the basal third; legs and feet orange-red, claws black.

Measurements. Wing 150 to 168 mm., rarely 137 to 150 mm., probably young birds; tail 69 to 85 mm.; tarsus about 45 to 52 mm.; culmen 40 to 49 mm.

In Winter the black markings and fulvous spots on the upper part disappear and the general tint is more grey, less brown; the underparts have the streaks much smaller and restricted to the sides of the neck, lower fore-neck and breast; the forehead is white and the sides of the head and neck much less heavily streaked.

Young birds are more rufous above, the fulvous spots on the scapulars etc. more marked and the flanks are more banded with black.

Nestling. Above rufous-buff, more fulvous on the sides of the head; well-marked black lines from forehead to crown, two lateral coronal bands meeting behind crown, through the eye from lores to the side of the neck; dark central and dorsal streaks; two dark lines on wings, one round the flanks and uropygium.

Distribution. Throughout Europe, Northern Asia, Asia Minor, etc. to the Himalayas as far East as Setchuan. In Winter it migrates South to South Africa and South Asia, India, Burma, China, Philippines etc.

Nidification. The Redshank breeds from early April to the middle of June. It makes no nest but lays its four eggs in a depression in the middle of a tuft of grass. It is always, or nearly always, carefully concealed by the growing grass but its position is often disclosed by the way the grass is curled round the opening above it. Although the birds sometimes nest in thick coarse grass and weeds, they prefer such as is short in meadows, or thin and wiry on sand-hills and sea-shores. Occasionally they collect in colonies and I have seen twelve nests in a quarter of one field and another time seven on the crest of a small sand-ridge about two hundred yards long. The four eggs are very handsome; their ground-colour varies from pale yellowish-stone to rich ochre-buff or buff, more rarely a greenish-stone colour. The marks consist of blotches of rich reddish-brown and purple-black with underlying spots of lavender and reddish-grey. In some specimens the markings are reduced to small specks and spots and there is every grade of marking intermediate between the two, but streaks and scrolls are quite exceptional. One hundred British eggs average 44·5 x 31·5 mm.: maxima **48·0** x 32·0 and 46·5 x **33·1** mm.; minima **41·5** x **28·5** mm.

In India the birds in Ladak, Kashmir and Tibet lay during June and July and they certainly breed up to an elevation of 14,500 feet and possibly higher still. They are common breeding-birds throughout Ladak and Tibet.

Habits. During the breeding-season the Redshank keeps much to marshes, wet meadows, grass-covered sand-hills etc., but when the young are hatched and fledged they resort to the sea-shore and almost entirely desert the inland waters. In India, however, they may be found during the cold weather in almost any large marsh or on the big rivers. They are shy birds and generally rise at some distance, uttering their loud but musical "twe-ee, twe-ee" as they rise. As a rule they will be found in pairs or single but on arrival in India during September, and again on their departure in early April, they may often be seen in flocks of scores or even hundreds.

(2148) Tringa totanus terrignotæ.

THE CENTRAL ASIAN REDSHANK.

Totanus totanus terrignotæ Meinertzhagen, Bull. B.O.C., xlvi, p. 85 (March 1926) (Kuku Nor).
Totanus calidris. Blanf. & Oates, iv, p. 264 (part.).

Vernacular names. As in the other races.

Description. Much paler than the Western race both in breeding and non-breeding plumage, whilst in the former it is much more marked and suffused with rufous on the mantle. It is also rather less heavily spotted below in some cases.

Colours of soft parts as in the preceding bird.

Measurements. "Wings 145 (once), 148 (once), 151 to 169; exposed culmen 40 to 47 mm., true culmen 46 to 53 mm." (*Meinertzhagen*).

Distribution. Breeding Tianschan, Kuku Nor, Turkestan. In Winter migrating South to India, Burma, Malay States and Archipelago and South China. Birds from Aden and one from Sokotra are also referable to this race but some from Amur Bay and Mongolia seem to belong to the typical race, though somewhat intermediate.

Nidification unknown.

Habits. Those of the species. This seems to be a quite common visitor to Eastern India, Burma and Malay States, the strikingly pale rufous plumage making them very easily distinguishable from the Western form. The two forms are found together in Winter over a very wide area but apparently have quite different breeding-haunts, from which more skins are badly wanted.

(2149) Tringa erythropus.

THE SPOTTED OR DUSKY REDSHANK.

Scolopax erythropus Pallas, Vroeg's Cat. Coll. Adum., p. 6 (1764) (Holland).
Totanus fuscus. Blanf. & Oates, iv, p. 245.

Vernacular names. *Batan*, *Gatni*, *Súrma* (Hind.); *Yerra kal ulanka* (Tam.).

Description.—Breeding plumage. Whole head, neck and lower parts sooty-black, the feathers of the head and neck very narrowly margined with white, those of the chin, lower breast and abdomen with broad white fringes; the mantle black with white edges to each feather and white spots on the sides of each web; many of the scapulars and inner secondaries more bronze-grey with broken black bars and white notches; lower back and rump white; upper tail-coverts barred black and white; tail with broader bars of black and more narrow bars of white; quills blackish, the shaft of the first primary white, the inner webs mottled with white.

Colours of soft parts. As in the Redshank; legs dusky to orange-red.

Measurements. Wing 152 to 168 mm., exceptional to 172 mm.; tail 76 to 91 mm.: tarsus 53 to 61 mm.; culmen, ♂ 53 to 59 mm., ♀ 56 to 65 mm.

In Non-breeding plumage. Above ashy-brown, the crown and neck immaculate, the upper back with tiny white fringes to each feather, broader on the scapulars and inner secondaries, which are notched with black and white; wing-coverts with broad white fringes; supercilium white; lores dark brown; sides of face and neck grey, lightly streaked darker, chin and throat white; fore-neck pale ashy-brown; remainder of lower plumage white.

Nestling. Very like that of the Common Redshank but upper down paler, almost buffy-white or greyish-white; underparts greyish-white tinged with buff, the down of the breast with dark bases which show up. Markings more brown, less black than in the preceding species.

Distribution. Breeds throughout Artic Europe and Asia, in Winter migrating South to Africa, India, Burma, China and the Malay States and Islands.

Nidification. The Dusky Redshank breeds from the last week in May to the end of June, laying its eggs in depressions in the ground like other Sandpipers but very often selecting quite dry places on moors with a certain amount of tree-growth. A favourite site is said to be a piece of burnt moorland near trees. The four eggs are typical Sandpipers' but as a series they are very decidedly green. The ground-colour varies from pale olive or sea-green to a pale sage-green with large and numerous blotches of reddish-brown to blackish-brown and secondary ones of lavender and grey. Other eggs have the ground-colour pale stone to rather deep brownish-buff, but these are in the minority. One hundred eggs (*Jourdain*) average 47·2 × 32·2 mm.: maxima **51·5** × 33·0 and 48·0 × **34·0** mm.; minima **42·0** × 32·5 and 50·0 × **30·0** mm. It is said that the male bird does the greater part of the incubation.

Habits. In its breeding-haunts this Sandpiper generally keeps much to dry uplands but in India it will be found, like other Sandpipers, wading about in marshes or on the banks of rivers and lakes, sometimes singly or in pairs but at other times, especially just after arriving in September, in big flocks. It is a very active bird and wades more than most Sandpipers, feeding on aquatic insects, mollusca, worms, small fishes, tadpoles etc. Its call is syllabified by Witherby as "tchuet, tchuet," a harsher, less musical call than that of the Common Redshank.

Genus **GLOTTIS**.

Glottis Koch, Syst. Zool., pp. xlii, 304 (1816).

Type, *Scolopax nebularia* Gunnerus.

It is with considerable doubt that I separate the two birds contained in *Glottis* from *Tringa*. Their very decidedly recurved bills seem, however, to form a character of sufficient importance to rank as generic. The difference in the webs between the outer and inner and middle toes in these two birds and the genus *Tringa* is so very minute that it is of no importance at all.

In *Glottis* the bill is upturned over the terminal half of its length; the grooves and nostrils are as in the genus *Tringa*, the web between the outer and middle toe is well developed, that between the inner and middle toe obsolete; the wing is long with the first primary longest; the other characters are as in *Tringa*.

The Summer plumage differs from the non-breeding plumage in being darker.

The genus is cosmopolitan.

Key to Species.

A. Larger; wing 179 to 200 mm.; tarsus much longer in comparison, measuring 59 to 65 mm. *G. nebularia*, p. 225.
B. Smaller; wing 174 to 181 mm.; tarsus much shorter in comparison; 50 to 57 mm. ...... *G. guttifer*, p. 226.

(2150) Glottis nebularia.

THE GREENSHANK.

Scolopax nebularia Gunnerus, Beskr. Finmark, Lapp., p. 251, note (1767) (Norway).
Totanus glottis. Blanf. & Oates, iv, p. 266.

Vernacular names. *Tantanna, Timtimma* (Hind.); *Gotra* (Beng.); *Peria kotan* (Tam.); *Maha oliya* (Cing.).

Description.—**Breeding plumage.** Head, neck and mantle blackish, the feathers of crown and neck edged longitudinally with white; back and scapulars with white edges forming lunar bars, the longer scapulars barred black and white on their edges, the inner secondaries notched with white; lower back and rump white; tail-coverts and tail white barred with light brown; central tail-feathers nearly all ashy-grey; wing-coverts brown, edged with whitish; primaries blackish, the outermost with a white shaft and the inner webs mottled with white and brownish on the basal two-thirds; the inner primaries and outer secondaries dark brown edged with whitish; sides of head, chin, throat, breast and flanks white, boldly streaked with blackish; centre of abdomen and vent unspotted white; under tail-coverts white with black streaks; under wing-coverts and axillaries white with light brown marks.

Colours of soft parts. Iris brown; bill dark horny-brown or greenish-brown, blacker at the tip; legs yellowish-green or olive-green.

Measurements. Wing 179 to 200 mm.; tail 88 to 100 mm.; tarsus about 59 to 65 mm.; culmen 51 (one) to 57 (one) mm.

In Winter the forehead is white; the whole plumage much more grey, the blackish centres being replaced by paler ashy-brown with dark shafts; the under plumage is pure white from chin to under tail-coverts.

Young birds are much browner, less grey in general tint, more spotted with whitish on both webs of the mantle-feathers and have the underparts more streaked with brown.

Nestling is marked like that of the Redshank but the upper parts pale buffy-grey-white, more buff on the back and rump; the underparts are white, the fore-neck and sides of the head and neck suffused with grey.

Distribution. Northern Europe and Asia, migrating South in Winter to Africa, India, Burma, Malaya, China and Australia. I can find no difference whatsoever in size or colour between the Eastern and Western forms and consider *glottoides** merely a synonym of *nebularia*.

Nidification. The Greenshank breeds from early May in the South of its habitat to mid-June in the most Northern parts. The nest is merely a depression in the ground, lined with a little grass or a few leaves and the site selected is nearly always on open moors near some such landmark as an exceptionally high tuft of grass or heather, a stone or piece of fallen timber. The close vicinity of water is not a necessity, though the nest may often be found by little lochs and streams. The four eggs are of the usual long peg-top shape and in ground-colour vary from olive-stone or pale buff to fairly warm buff, whilst the markings consist of blotches and spots of reddish-brown to chocolate-brown with secondary markings of grey or lavender. Jourdain gives the average of one hundred British eggs as 51·4 × 34·8 mm.: maxima **59·8** × **37·7** mm.; minima **45·8** × 35·4 and 50·4 × **32·4** mm. The male bird does a considerable part if not all of the duty of incubation.

Habits. This bird frequents wide open moorlands, the shores of lakes and marshes and, in Winter, the sea-shores, more especially such as are muddy, like inland estuaries and backwaters. In India it is found as often on the larger rivers and inland swamps and lakes as on the coast. It feeds on all kinds of insects, small mollusca, worms, grubs, small frogs, tadpoles etc. and, it is said, small fish. For the table it is very little inferior to the Snipe and by the end of the Cold Season is often a little lump of fat. Its call is a harsh, loud replica of that of the Redshank and in flight also it is very similar to that bird.

(2151) Glottis guttifer.

ARMSTRONG'S SANDPIPER.

Totanus guttifer Nordman, Reise u. d. Erde (Erman) Natur. Atlas, p. 17 (1835) (Okhotsch): Blanf. & Oates, iv, p. 267.

Vernacular names. None recorded.

Description.—Breeding plumage †. "Differs from the Winter plumage in being blacker above and being spotted below with black; the crown blackish streaked with whitish edges to the feathers; the feathers of the back black, with spots of white to the edges of the feathers, more distinct on the scapulars and inner secondaries; upper tail-coverts and centre tail-feathers with slight indications of black spots; sides of face and sides of neck white, with triangular spots of black, larger on the latter; the ear-coverts slightly ashy-grey with obscure dusky streaks; under surface of body pure white, with a few small spots or streaks of black, irregularly scattered over the throat and breast, larger and more thickly distributed over the sides of the upper breast, and scarcely visible on the flanks; under wing-coverts and axillaries pure white" (*Mus. Henry Seehohm*).

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* *Totanus glottoides* Vigors, P. Z. S., 1831, pl. 173 (Himalayas, India.)

† There is no specimen in the British Museum in breeding-plumage and this description is copied from the Catalogue of Birds, xxiv, p. 480, which is apparently copied from one of Seebohm's descriptions.

Colours of soft parts. "Bill dusky, tipped black, yellow near the base; irides dark brown; legs and feet dull ochreous-yellow or greenish-ochreous" (*Armstrong*).

Measurements. Wing, ♂ 178 mm., ♀ 174 to 181 mm.; tail 62 to 67 mm.; tarsus 45 to 47 mm.; culmen 50 to 57 mm.

In Winter the whole mantle is ashy-grey, each feather with dark shafts and whitish edges, much less conspicuous than in the preceding bird, and the white very soon abraded and obsolete; the forehead, lores and sides of the head are white, the two latter distinctly spotted with black; crown and hind-neck ashy, the feathers white-edged and dark-shafted, the sides of the neck spotted with blackish; lower back, rump and upper tail-coverts white, the latter laterally barred with brown; tail white, with light brown contour marks; wings as in *Glottis nebularia*, underparts pure white, the neck slightly spotted with dark brown; axillaries pure white.

Young birds resemble those of the Greenshank and are much more brown above than the adult, the feathers spotted and notched with buff; the throat and upper breast streaked and mottled with brown.

Distribution. Apparently breeding in North-East Siberia and wandering South to North-East India, Burma and Hainan in Winter. Whether it breeds regularly or not in Tibet is not known. Eggs were taken by Steen in 1910 which he attributed to the Greenshank but which are exactly like an egg sent me with remains of a skin of Armstrong's Sandpiper, so that it is certainly a casual breeder in that country.

Nidification. Nothing recorded. The eggs referred to in the preceding paragraph were taken near Gyantse at an elevation of some 15,000 feet on the 16th of May and the 3rd of June, whilst that sent me with the skin was taken on the 29th of May. They are exactly like Greenshanks' eggs but, as one would expect, much smaller. Six eggs average 47·9 × 33·0 mm.: maxima **49·2** × **36·6** mm. and minima **46·4** × 34·3 and 47·4 × **31·5** mm.

Habits. Very little known beyond the fact that they are said to frequent sand-banks and mud-flats near the sea in company with other Waders.

Genus PHILOMACHUS.

Philomachus Anon., Allg. Lit. Zeit., 1804 (2), p. 168, col. 54.

Type by mon., *Tringa pugnax* Linné.

This genus is distinguished from others in having the male much larger than the female, whilst the former in the breeding-season assumes a ruff of long feathers extending from the nape down each side of the neck and varying in colour to the most extraordinary degree. The Ruff is said to be polygamous and fights and displays for the females in a manner very like some of the Game-birds.

The bill is moderately long, straight and flexible, both mandibles grooved over the greater part of their length, the linear nostril being placed in the groove close to the base of the upper mandible; the wing is of the usual shape, long and pointed with the first primary longest; the inner secondaries are lengthened; tail rather short and rounded; the tarsus is longer than the bill from the gape and transversely shielded in front and behind; hind toe moderate, outer and middle toe connected by a web, that between the inner and middle toe obsolete; the tail-coverts are very long.

There is but one species which extends throughout Europe and Asia.

(2152) Philomachus pugnax.

THE RUFF AND REEVE.

Tringa pugnax Linn., Syst. Nat., 10th ed., i, p. 148 (1758) (Sweden).
Pavoncella pugnax. Blanf. & Oates, iv, p. 268.

Vernacular names. *Geh-wala* (Hind.).

Description.—Winter plumage. Forehead, feathers round the eye, cheeks and chin whitish, more or less suffused with buff; lores speckled brown and buff; upper parts brown, the feathers of the crown, scapulars and inner secondaries with visible dark brown centres and bands, concealed on the hind-neck and upper back; tail brown with pale edge to the tip; wing-coverts like the back; the greater with broad white edges, primary coverts black with white edges; primaries brownish-black with white shafts; outer secondaries brown with white edges and tips; lower plumage and axillaries white, the throat, fore-neck and breast suffused with brown or buff.

Colours of soft parts. Iris brown; bill dark brown, more yellow and paler at the base; legs and feet fleshy-yellow to horny-brown in adults; grey, olive-grey or plumbeous in the young.

Measurements. Wing, ♂ 173 to 190 mm., ♀ 150 to 166 mm.; tail, ♂ 78 to 89 mm., ♀ 64 to 70 mm.; tarsus, ♂ 46 to 50 mm., ♀ 41 to 44 mm.; culmen, ♂ 30 to 36 mm., ♀ 29 to 31 mm.

In Summer both sexes have the upper parts blackish, the feathers edged with buff or rufous, whilst the breast, flanks etc. are much more suffused with brown.

The male at this season has the face covered with yellow caruncles and grows an enormous ruff which extends from the nape to cover the entire breast. This ruff may be of any colour, chestnut, buff, white, black or grey; sometimes it is immaculate but most often it is closely barred or streaked with blackish; whatever may be the dominating colour of the ruff, it extends to the mantle and scapulars and, less often, to the inner secondaries as well as to the sides of the breast and flanks.

Young birds resemble the female in Summer but are duller and less barred and marked with blackish; the underparts are more strongly sullied with brownish-isabelline.

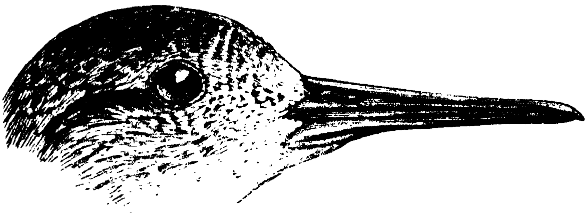

Fig. 37. Head of *P. pugnax*. 1/1. (Winter.)

Distribution. Northern Europe and Asia, migrating South in Winter to Africa, India, Burma, etc. as far as Ceylon and Tenasserim.

Nidification. The Reeve lays from early May, or even in the last week of April, to the third week in May but in the most Northern parts occasionally in early June. The cock-birds are polygamous and meet on a bare piece of ground regularly in the mornings and evenings, where they fight and display for the possession of the females. The nest is a fairly well lined and very well hidden depression in a tuft of grass in marshland or wet meadow, occasionally in grass on a sand or stony hillock. The hens can hardly be said to nest in colonies but, as a rule, several nests will be found close together and not far from the "hill," as the courtship ground is termed. The clutch of eggs is usually four, but three is much more common than with most Waders. They are rather like the eggs of the Great Snipe and some records of the occurrence of the Reeve have been based on the obtaining of eggs which are much more likely to have been those of the Snipe. The ground-colour varies from pale to deep ochraceous, sandy-clay, buff or olive-green and they are blotched with reddish-brown, dull brown and secondary marks of lavender. One hundred and forty-one eggs (*Jourdain*) average 43·9 × 30·7 mm.: maxima **47·5** × 30·5 and 43·2 × **32·1** mm.; minima **39·8** × 31·6 and 42·9 × **28·0** mm.

Habits. The Ruffs and Reeves, all in Winter dress, arrive in India in the last few days of August or early in September and leave, the males often in nearly full dress, in April. They have much the same habits as the Greenshank but keep more in flocks and more to marsh and dry land than to mud and water. They feed on the same kind of food and also on berries, seeds, rice and other grain and are, when in good condition, excellent eating. Their call is a low "chuck, chuck," but they are, on the whole, silent birds.

Subfamily EROLIINÆ.

In this subfamily are contained those genera in which the anterior toes are divided to the base. In one genus there is no hind toe but in the others this is well developed. The wing is shaped as in the *Tringinæ*, with the first primary the longest; the bill is slender, flexible and either quite straight or slightly bending downwards; the inner secondaries are very nearly as long as the primaries; the tail is moderate and nearly square, some species having the median rectrices slightly acuminated and projecting beyond the others of which they, in consequence, have been placed in a separate genus by some authors.

Key to Genera.

A. No hind toe	CROCETHIA, p. 231.
B. A hind toe.	
a. Bill spoon-shaped, greatly expanded at the tip....................	EURYNORHYNCHUS, p. 232.
b. Bill slender, not spoon-shaped	EROLIA, p. 233.

Genus **CROCETHIA.**

Crocethia Billberg, Synops. Faun. Scand., i, (2) tab. A, p. 132 (1828).

Type by mon., *Tringa alba* Vroeg.

This genus, which contains but one species, the Sanderling, is very close to *Erolia* but is separated from that genus by possessing a hind toe; the bill and tarsus are about equal in length.

(2153) Crocethia alba.

THE SANDERLING.

Trynga alba Pallas, Vroeg's Cat. Coll. Adum., p. 7 (1864) (Holland).
Calidris arenaria. Blanf. & Oates, iv, p. 279.

Vernacular names. None recorded.

Description.—Breeding plumage. Upper parts rufous, each feather with a broad black centre and narrow white fringes; lateral rump-feathers and upper tail-coverts white; central tail-feathers blackish, narrowly tipped with white and paler on the inner webs, lateral feathers grey-brown edged with white; primaries black with white shafts and with pale inner webs becoming white, extending to the outer webs on the innermost primaries; outer secondaries grey with white edges; greater coverts brown with broad white tips; inner coverts like the back; chin, throat, fore-neck and upper breast rufous spotted with black; remaining under plumage, axillaries and under wing-coverts white, the rufous with black spots sometimes extending down the flanks.

Colours of soft parts. Iris dark brown; bill black; legs and feet dusky-grey or brown to black.

Measurements. Wing 118 to 129 mm.; tail 52 to 62 mm.; tarsus 23 to 26 mm. (once 21 mm. only); culmen about 21 to 26, once 28 mm.

In Winter the upper plumage is black with broad white edges, giving the impression of greyness; the hind-neck is generally grey, the dark centres obsolete: forehead and face white, but generally some rufous and black markings on the lores; lower back, rump and upper tail-coverts grey, the back and rump with tiny black bars, the coverts with pale whitish tips and blackish sub-tips merging into the grey of the base: wing-coverts and innermost secondaries like the back; quills as in the Summer plumage: lower plumage all white.

Distribution. Cosmopolitan, breeding in the Artic regions and migrating South in Winter over all the Southern continents. In India it is a common visitor to the North-West, extending South to the Maldives and the Malabar coast (one); East it is found scattered here and there throughout Eastern India and Burma, though very rare. It occurs also on Christmas Island, Henderson Island and more frequently in Borneo.

Nidification. The breeding of the Sanderling is so far North that but little has been recorded. It lays from the end of June to the middle or end of July, laying the normal four eggs in a scraping in the soil of the tundras, generally selecting a rather bare, stony patch. In colour the eggs have a rather dull greenish ground, becoming more buff if kept for long, spotted and speckled rather sparsely with reddish-brown and ashy-grey. The average of forty-one eggs (*Jourdain*) is given as 35·7 × 24·7 mm.: maxima

38·2 × 24·7 and 34·1 × **26·1** mm.; minima **33·1** × 24·4 and 35·3 × **23·5** mm. Both male and female take a share in incubation.

Habits. Very much the same as those of other small Waders, with which, in India, it is generally found consorting in small flocks, running about on sand and mud-flats, feeding on all kinds of small mollusca, insects, worms etc.

Genus EURYNORHYNCHUS.

Eurynorhynchus Nilsson, Orn. Suecica, ii, p. 29 (1831).

Type by mon., *E. griseus*=*Platalea pygmæa* Linn.

This genus is easily distinguished from all others by the remarkable shape of its bill, which terminates in a flat quadrilateral disk, bluntly angulate at each side and at the end; the basal portion of the bill is depressed throughout with height and breadth about equal; the nostrils are small and placed quite at the base; the other characters of the genus are those of *Erolia*.

(2154) Eurynorhynchus pygmæus.

THE SPOON-BILL STINT.

Platalea pygmæa Linn., Syst. Nat., 10th ed., i, p. 140 (1758) (Surinam).
Eurynorhynchus pygmæus, Blanf. & Oates, iv, p. 271.

Vernacular names. None recorded.

Description.—Breeding plumage. Forehead mottled rufous, black and white; crown black, with rufous edges and narrow white tips; hind-neck duller and greyer; back, scapulars and inner secondaries black, each feather edged laterally with rufous and terminally with white; lower back, rump and upper tail-coverts duller with no rufous; central tail-feathers blackish, the inner webs paler, lateral feathers paler grey-brown with white edges; wing-coverts brownish-black with pale edges, the greater with broad white tips; primaries and primary coverts black, the former with pale inner webs; outer secondaries dark brown with whitish edges and tips; sides of head and neck, chin, throat and foreneck pale rufous, mottled with white; upper breast rufous, paling to white on the lower and boldly spotted with black; axillaries, under wing-coverts and rest of lower plumage white, the black spots extending down the flanks.

Colours of soft parts. Iris dark brown; bill, legs and feet black.

Measurements. Wing 96 to 105 mm.; tail 42 to 50 mm.; tarsus about 20 to 23 mm.; culmen 21 to 23 mm.

In Winter plumage the rufous on the head and neck is replaced by white and the breast is unspotted or nearly so; the rufous on the upper plumage disappears, the mantle-feathers are more broadly edged with white, and are grey-brown, instead of black, with black shafts.

Young birds are like the adult in Summer without the rufous.

Distribution. Breeding North-East Siberia. In Winter South to China, Burma and Eastern Bengal. In Southern Burma it has been recorded several times; one specimen was obtained near Calcutta, two were shot by Mr. Eden in the Sibsagar District of Assam and one by myself on the Megna Sunderbands.

Nidification unknown.

Habits. Very little recorded. In Siberia it is said to haunt tundras close to the bigger rivers. In India it is found either singly or in pairs, generally in company with other small Waders.

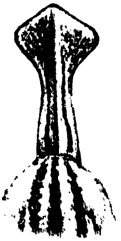

Fig. 38.—Bill of *E. pygmaeus*. $\frac{1}{1}$.

The two shot by Mr. Eden were a pair and that shot by myself a single bird on a sand-bank in company with the Little Stint. The bird shot by myself had eaten nothing but the most minute red crabs, which swarmed everywhere on the sand and adjoining mud-flats. The only note uttered was a shrill "wheet, wheet" as it rose.

Genus EROLIA.

Erolia Vieill., Anal. nouv. Orn., p. 55 (1816).

Type by mon., *Erolia variegata* = *E. ferruginea* Brunnich.

In this genus the bill is flexible and slender, varying a good deal in length and either straight or slightly curving downwards; both mandibles are grooved and the small nostril is placed near the base; the tarsus is short and scutellated: there is a hind toe present and the anterior toes have no webs between them; the wing is long and pointed, the first primary longest; the tail is nearly square, with the central feathers pointed and projecting beyond the others.

In the present work I retain all the species accepted by Blanford as belonging to *Tringa* (= *Erolia*) with the exception of the Knots, which are now generally accepted as belonging to a different genus and the Broad-billed Sandpiper, which is retained in a genus, *Limicola*, by itself and which is now universally accepted. This leaves seven species occurring within the limits of this work, whilst the genus, as a whole, may be said to be cosmopolitan.

Key to Species.

A. Bill straight.	
a. Culmen not exceeding 20 mm.; wing under 120 mm.	
a'. All shafts of primaries more or less white	
a^2. Sides of head not rufous	*E. minuta*, p. 234.
b^2. Sides of head rufous	*E. ruficollis*, p. 226.
b'. Shaft of first primary white, others brown	
c^2. Tail-feathers all brown..........	*E. subminuta*, p. 236.
d^2. Outer tail-feathers white	*E. temminckii*, p. 237.
b. Culmen about 23 mm.; wing over 120 mm.	*E. acuminata*, p. 239.
B. Bill curved downwards at the end.	
c. Upper tail-coverts mostly white	*E. testacea*, p. 240.
d. Upper tail-coverts blackish-brown	*E. alpina*, p. 241.

(2155) Erolia minuta minuta.

THE LITTLE STINT.

Tringa minuta Leisler, Nacht. Bechst. Nat. Deutsch., p. 74 (1812) (Hanau); Blanf. & Oates, iv, p. 273.

Vernacular names. *Chota Pau-loha* (Hind.).

Description.—Breeding plumage. Forehead and small supercilium, often obsolete, pale fawn; crown and mantle blackish, each feather with rufous edges to the sides and those of the mantle with white fringes; hind-neck paler and less broadly marked with black; lower back, rump, upper tail-coverts and central tail-feathers blackish with paler edges; sides of rump and lateral upper tail-coverts white; lateral tail-feathers pale grey-brown with whitish edges; wing-coverts grey-brown with darker centres and the greater with broad white tips; quills blackish with white shafts; the inner webs of the primaries and outermost secondaries paler and the central secondaries dark grey with white edges; under-plumage white, the breast suffused with rufous and speckled with black.

Colours of soft parts. Iris brown; bill black; legs and feet olive-plumbeous or blackish-brown.

Measurements. Wing 91 to 98 mm.; tail 38 to 43 mm.; tarsus about 20 to 21 mm.; culmen 17 to 19 mm.

In Winter the upper parts are grey-brown, the crown with broad black streaks, the hind-neck only faintly marked, the mantle with black shaft-streaks and the scapulars and secondaries edged with white; the greater coverts are grey-brown with broad white tips forming a wing-band; below the whole plumage is white, the breast sometimes faintly marked with brownish.

Young birds are like the adult in Summer with the whole underparts white or nearly so; the hind-neck is more grey, less rufous, whilst the rufous on the mantle less dominant.

Nestling. Upper parts rufous, mottled with black, the nape more ochraceous-buff and the crown dark buff; a black median coronal line and a second black line from the lores through the eye; sides of the head, chin, throat and breast ochraceous, remaining underparts white.

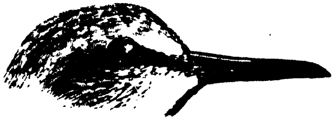

Fig. 39.—Head of *T. minuta.* ½.

Distribution. Northern Europe to Central Siberia, migrating South in Winter to Northern Africa, Palestine, Arabia, Mesopotamia, North-West and Western India to Ceylon; East it is more rare but extends to Bengal, Assam and Madras.

Nidification. The Little Stint breeds during June and early July from East Finland to Central Siberia within the Arctic Circle, and occasionally a few degrees South of this. It lays its four eggs in depressions in among grass and other herbage, generally well concealed and nearly always well lined with *Salix* leaves. The eggs, decidedly pointed, are in ground-colour a pale stone to deep buff, more rarely greenish, thickly marked with spots and blotches of rick vandyke-brown or reddish-brown, the secondary marks being hardly visible. As a series the eggs are more richly and boldly coloured than those of Temminck's Stints but many of them are quite indistinguishable from those of the latter bird. One hundred eggs (*Jourdain*) average 28·8 × 20·7 mm.: maxima **31·7** × 20·3 and 30·0 × **21·4** mm.; minima **26·7** × 20·0 and 28·7 × **19·6** mm.

The birds are extraordinarily tame during the breeding-season, as well as at other times, and do not resent observation in the least, continuing to sit on their nest to be watched within a few feet, even sitting for their photographs to be taken without any fear.

Habits. One of the most Northern of our breeders, this little Wader is also one of those which migrate farthest South and is common in South Africa and in Ceylon in Winter. In India it is common over the whole of the continent both inland and on the coast. It is a most restless, active little bird, very fast on wing or on foot, ever dashing about after its food, which consists of insects, tiny worms, mollusca, beetles and, sometimes, seeds. Its call-note is a low, soft "wick-wick-wick" and its note of alarm a rather harsher "drrrt" (*Miss Haviland*).

(2156) Erolia minuta ruficollis.

THE EASTERN LITTLE STINT.

Tringa ruficollis Pall., Reise. Reichs. Russ., iii, p. 700 (1776) (Dauria); Blanf. & Oates, iv, p. 274.

Vernacular names. *Chota Pan-loha* (Hind.).

Description.—Breeding plumage. Differs from the preceding bird in having the sides of the head, throat and fore-neck rufous, the feathers narrowly edged with white, which soon becomes abraded, the breast and flanks are more heavily spotted with black and there are sometimes black spots on the thigh-coverts and lateral under tail-coverts.

Colours of soft parts as in the Little Stint.

Measurements. Wing 92 to 100 mm.; tail 40 to 45 mm.; tarsus 20 to 21 mm; culmen 16 to 19 mm.

In Winter this race is only to be distinguished from the preceding by its rather larger size.

Distribution. East Siberia to Japan. In Winter South to China, Australia and East to Burma, the Andamans and the Malayan Archipelago.

Nidification. Nothing recorded.

Habits. Those of the genus.

(2157) Erolia subminuta.

THE LONG-TOED STINT.

Tringa subminuta Midden., Reis. N. O. & O. Siberia (1851) (Stanaway); Blanf. & Oates, iv, p. 275.

Vernacular names. None recorded.

Description.—Breeding plumage. Feathers above lores and indistinct supercilium whitish streaked with black; crown and mantle blackish, each feather broadly rufous on the sides and with a narrow white terminal fringe; lower back, centre of rump and upper tail-coverts blackish, the sides white; tail blackish on the central tail-feathers, the lateral ones brown; primaries blackish, paler on the inner webs and the first shaft white; coverts brown edged with white, forming a narrow wing-bar on the greater; primary coverts blackish; outer secondaries brown with white edges and tips; chin and throat dull white; sides of head, neck and breast greyish rufous-white spotted with blackish; axillaries and rest of lower primary white.

Colours of soft parts. Iris brown; bill olive-brown to blackish, paler at the base of the lower mandible; legs and feet pale olive-yellow to pale brown.

Measurements. Wing 87 to 95 mm.; tail 34 to 36 mm.; tarsus about 20 to 21 mm.; culmen 17 to 19 mm.

In Winter the upper parts are brownish-black, each feather margined with grey; sides of head and neck, fore-neck and breast greyish with dark shaft-streaks.

Distribution. Siberia from Lake Baikal to Eastern Manchuria, Japan, the Kurile Islands and the islands off Alaska. In Winter South to China, the Indo-Chinese countries, the Malay Archipelago generally, Burma, Eastern India to Ceylon.

Nidification unknown. Buturlin says that it breeds in Eastern Siberia, North to 60° Lat. and considerably further South inland.

Habits. This little Stint occurs in great numbers in Burma and Eastern India from September to March or the middle of April, often collecting in large flocks, whilst, at other times, they associate with other small Waders. In Assam I found them common on the muddy shores of swamps and also in the rice-fields. It has a shrill piping cry, which it utters as it rises and sometimes whilst running rapidly from one spot to another as it feeds in the mud.

(2158) Erolia temminckii.

TEMMINCK'S STINT.

Tringa temminckii Leisler, Nacht. Bechst. Nat. Deutsch., p. 63 (1812) (Hanau); Blanf. & Oates, iv, p. 275.

Vernacular names. None recorded.

Description.—Breeding plumage. Upper plumage black, the feathers of the crown edged with rufous, those of the back etc. barred and tipped with rufous; lower back and rump blackish; central tail-coverts blackish, finely edged and tipped with rufous and sometimes notched with the same; lateral tail-coverts white; inner wing-coverts and inner secondaries like the back; median coverts brown edged with grey; greater coverts darker brown, broadly edged with white; primary coverts and primaries black, the first primary with a white shaft, the inner primaries with a white patch at the base of the inner webs; outer secondaries brown with white bases and edges; sides of the head and neck fulvous-white streaked with dark brown; chin and throat fulvous-white, very lightly streaked; breast a darker fulvous streaked with black and with indefinite bars on the lower breast and anterior flanks; axillaries and lower plumage white; central tail-feathers brown; outer white.

Colours of soft parts. Iris brown; bill black; legs and feet olive-green or yellowish-olive.

Measurements. Wing 90 to 100 mm.; tail 45 to 48 mm.; tarsus about 16 to 19 mm.; culmen 15 to 17 mm.

In Winter the upper plumage is light grey-brown, each feather with paler grey edges and a dark shaft-streak; head and neck paler and more grey, the shaft-streaks obsolete; forehead and supercilium white; sides of the head pale grey; chin and throat white; fore-neck, sides of neck and extreme upper breast pale brownish-grey, the centres of the feathers darker; remainder of under-plumage white.

Nestling like that of the Little Stint but paler, more yellowish-buff and less cinnamon or rufous.

Distribution. Breeding from Scandinavia to North-East Siberia. In Winter South to North Africa and Southern Asia. In India found all over the North in great numbers, becoming less common in the South and rare in Ceylon. It is common some Winters in Assam and Bengal but much less common in Burma, though it is found as far South as Tenasserim.

Nidification. Although the breeding-areas of this and the Little Stint overlap, Temminck's Stint breeds much farther South and the Little Stint much farther North. In the South most birds lay in early June but in the North few lay before the end of June and many in late July. The nest is much like that of the Little Stint and neither eggs nor nest could with certainty be distinguished from those of that bird but the latter is generally lined with grass bents. On the whole the eggs are rather less boldly marked. One hundred average 27·9 × 20·4 mm.: maxima **30·5** × 20·8 and 28·8 × **21·5** mm.; minima **25·5** × 20·8 and 28·2 × **19·4** mm. The birds sit very close but are not quite so tame as the Little Stint. The nests are often built several close together and a favourite site is at the edge of some small lake or swamp on upland tundras.

Habits. Much the same as those of the Little Stint, occurring in India in flocks of some size, though these sometimes split up shortly after the arrival of the birds in India. They feed on insects, tiny worms and coleoptera. The only note I have heard is a short, sharp whistling "tweet" as they rise but they are very silent birds in the Winter.

(2159) Erolia acuminata.

THE ASIATIC PECTORAL SANDPIPER.

Totanus acuminatus Horsf., Trans. Linn. Soc., xiii, p. 192 (1821) (Java).
Tringa acuminata. Blanf. & Oates, iv, p. 276.

Vernacular names. None recorded.

Description—Breeding plumage. Lores, edge of forehead and supercilium white with tiny black streaks; crown rufous with black streaks; hind-neck duller paler rufous with black streaks; mantle rich rufous, each feather broadly centred black and the scapulars, inner secondaries and wing-coverts edged with white; lower back, rump and upper tail-coverts blackish, narrowly edged rufescent; the lateral rump- and covert-feathers white with black centres; central tail-feathers blackish, edged with chestnut-rufous, lateral feathers lighter brown edged with white; wing-coverts dark brown, edged rufous and white; primary coverts and primaries black, the first primary with a white shaft; outer secondaries brown with white edges; underparts white, strongly tinged with rufous on the breast and fore-neck; chin to breast streaked with blackish, becoming bars on the flanks, abdomen and under tail-coverts.

Colours of soft parts. Iris brown or chocolate; bill dull black; legs and feet yellow-ochre.

Measurements. Wing 124 to 140 mm.; tail 45 to 58 mm.; tarsus 28 to 29 mm. (once 31 mm.); culmen 23 to 27 mm.

In Winter the upper parts are rather less rufous and black but the difference is not great; the breast, flanks and fore-neck are rufous-buff, the latter only lightly streaked with blackish.

Young birds are like the adult but have the upper parts more marked with cinnamon or rufous.

Distribution. Breeding in North-East Siberia and Alaska; in Winter South to China, the Indo-Chinese countries, the Malay States and Malay Archipelago and once obtained by Scully at Gilgit. To the East it is common in Australia.

Nidification unknown. Dybowski found it during June in Dauria, where it probably breeds.

Habits. Those of the genus *.

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* This species is often separated from *Erolia* on account of its sharply-pointed and rather long central tail-feathers and Mathews, who divides *Erolia* into several genera, retains this bird under the generic name *Limnocinclus*. As, however, the tail varies very greatly and in nearly all species has the central tail-feathers more or less pointed, the differences do not seem of generic value.

(2160) Erolia testacea *.

THE CURLEW-STINT OF PIGMY SANDPIPER.

Scolopax testacea Pallas, Vroeg's Cat. Verzam. Vögel. Adum., p. 6 (1764) (Holland).
Tringa subarquata. Blanf. & Oates, iv, p. 278.

Vernacular names. None recorded.

Description.—Breeding plumage. Forehead and feathers next the bill mottled black and white and rufous; the crown rich rufous, boldly streaked with black, the hind-neck very faintly streaked but each feather finely edged with white; mantle black, with broad lateral spots of rich rufous which become streaks or broken bars on the scapulars and inner secondaries; lower back black with grey edges; upper tail-coverts white with narrow black bars; tail light brown with white edges to each feather and a dark sub-edge to the central feathers; wing-coverts brown with paler edges and dark shafts; the greater with broad white edges which form a wing-bar in unabraded plumage; primary coverts and primaries blackish, the latter with white shafts; outer secondaries grey-brown with white edges; head and lower plumage to vent rich rufous, the feathers more or less fringed with white which dominates on the chin and face; lower tail-coverts white with black bars and a little chestnut marking; under wing-coverts and axillaries white.

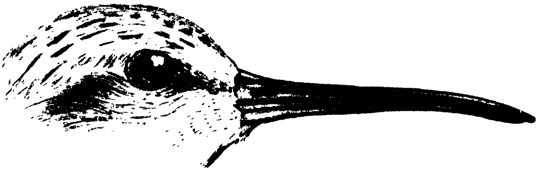

Fig. 40.—Head of *E. testacea*. $\frac{1}{1}$.

Colours of soft parts. Iris brown; bill black; legs and feet dull greyish-plumbeous to black.

Measurements. Wing 123 to 128 mm.; tail 42 to 49 mm.; tarsus about 28 to 31 mm.; culmen 33 to 43 mm.

In Winter the crown and mantle are grey-brown, the head obsoletely streaked darker and all the feathers with dark shaft-lines; a fairly distinct supercilium from the forehead to the nape; lores and sides of head streaked brown and white; lower plumage and axillaries white; sides of neck, throat, fore-neck and breast streaked with brown and the latter suffused with brown, most strongly so on the sides; edge of wing underneath with small brown bars.

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* I cannot distinguish between *E. f. ferruginea* and *E. f. chinensis* of Gray, either in measurements or in colour or shade of colour. The name *ferruginea* is preoccupied, having been used by Pontoppidan for a bird which is indeterminate and cannot therefore be used for the Curlew-Stint.

Young birds have the feathers of the upper plumage fringed with whitish-grey or buff and the breast, throat, fore-neck and flanks suffused with grey-buff.

Distribution. Breeding in the North of Siberia and migrating South in Winter to Africa and the whole of South Asia to Australia. In India and Burma it occurs commonly over the whole area to Ceylon.

Nidification. The Curlew-Sandpiper breeds in Asiatic Siberia, the eggs having been first taken by Popham on the Yenesei in late June and early July. The nest is a depression in the reindeer moss of the tundras, a slightly raised spot, drier than the surrounding swampy land, being selected for the purpose. The eggs, four in number as usual, have a grey-green ground-colour thickly marked with deep red-brown blotches and spots with others underlying of purple-grey. Twelve eggs average 36·7 × 25·6 mm.

Habits. In the non-breeding season this Sandpiper frequents the shores of the sea, big rivers and lakes, associating in flocks often of great size. In flight etc. it closely resembles the Dunlin, whilst its food consists of sand-hoppers, small crustacea, worms, insects etc. Miss Haviland syllabifies its alarm-note in the breeding-season as "wick-wick-wick," whilst in Winter it has a twittering call as well as a rather shrill single note.

(2161) Erolia alpina alpina.

THE DUNLIN.

Tringa alpina Linn., Syst. Nat., 10th ed., i, p. 149 (1758) (Lapland); Blanf. & Oates, iv, p. 279.

Vernacular names. None recorded.

Description.—Breeding plumage. A narrow line next the bill and a faintly indicated supercilium white, streaked with black; upper plumage bright deep rufous, each feather broadly centred black and some of the longer scapulars and innermost secondaries terminally edged with white; hind-neck greyish-white streaked with black; lower back and rump dark grey-brown, showing little rufous or black; sides of rump and lateral tail-coverts white; central tail-feathers blackish-brown, the lateral grey with white edges; wing-coverts grey-brown with darker centres and pale or whitish edges; the greater coverts with broader white edges; primary coverts and primaries blackish, the former narrowly edged whitish, the latter white-shafted, but the lores and tips of the shafts of the second and third primaries brownish; outer secondaries nearly all white with dark centres; sides of head, chin, throat and upper breast white streaked with blackish, often suffused with rufous, especially on the chin and fore-neck; centre of breast and abdomen blackish-brown; flanks, axillaries and under tail-coverts white, the last streaked with black.

Colours of soft parts. Iris hazel or dark brown; bill and legs black.

Measurements. Wing 104 to 120 mm.; tail 46 to 51 mm.; tarsus about 21 to 26 mm.; culmen 25 to 31 mm.

In Winter. Upper plumage ashy-grey, the feathers of the head with darker brown streaks, the remainder with dark shaft-stripes only; innermost secondaries darker and browner with narrow whitish or rufescent-white edges; lores, sides of the head, neck and fore-neck fulvescent-grey with dark brown streaks, remainder of lower plumage white.

Young birds have the upper plumage like the adult in breeding plumage but are much less richly rufous and have more white edges to the feathers of the mantle, the fore-neck is dull pale rufous and the underparts are white, more or less spotted with brown.

Nestling. Centre of crown and centre of back deep chestnut surrounded by black; a black line through the eye, becoming chestnut posteriorly; a narrow line on the wings black; a black patch on each side of the europygium and a line across joining the black round the centre of the back, the down ending in little whitish tufts; rest of upper surface rich rufous-buff; below whitish-buff, the chin, throat and breast darker.

Distribution. Europe from Lapland to Eastern Russia but replaced in the South by *E. a. schinzii*. Northern Asia. In India it is common during the Winter in Sind and the North-West, extending as far South as the Deccan and East to Nepal, E. Bengal and Assam, though it is rare East of the United Provinces. All our specimens from India appear to be typical *E. a. alpina* and not the more tawny-headed *schinzii*. I cannot separate *E. a. pusilla*, the supposed Indian form, from the typical bird.

Nidification. The Dunlin is an early breeder, commencing to lay in the first week of May, though in the North eggs may still be found in late June. The nesting-site is usually on wet upland heather lands, or the marshy tops of grass-covered hills and, even when in dry heather, is always near water. The nest is a very neat cup worked out among the roots of the grass or heather, very carefully hidden and neatly lined with dry grass or leaves. The bird sits very close directly incubation actually commences, getting up at one's feet and jumping into the air with a zigzag action before flying off. Sometimes it feigns injury and flutters along the ground in front of one, attempting to attract attention from the nest. The four eggs vary considerably in colour. In most eggs the ground-colour is some shade of yellowish or buff but in a minority it is pale blue-green to olive. The markings vary from specks and small spots to blotches of deep brown, reddish-brown, purple or chocolate-brown with secondary markings, sometimes obsolete, of grey. One hundred eggs average 34·3 × 24·4 mm.: maxima **38·3** × 25·4 and 35·0 × **25·8** mm.; minima **31·3** × 23·2 and 32·0 × **23·0** mm.

Both sexes assist in incubation.

Habits. In Winter the Dunlin abandons the peat-lands and boggy uplands and resorts to the sea-shore, the muddy banks of inland waters and the shores of the larger rivers. It is a very active little bird, occasionally sitting still for a moment with its head tucked close into its shoulders but far more often running hither and thither as it hunts for its food. This consists principally of mollusca, snails, slugs, worms, sand-hoppers and all kinds of insects. Occasionally seeds and grain have been found in their stomachs. In the breeding-season it has a pretty, trilling love-song, uttered on the wing, but its ordinary call is a prolonged "wee-e-et" and it is said to have also a soft "purr" in the Winter.

Genus **CALIDRIS.**

Calidris Anonymous, Allg. Lit. Zeitung, 1804, No. 168, col. 542.

Type by taut., *Tringa calidris* = *Tringa canutus* Linn.

In this genus the bill is long, straight and stout; both mandibles grooved and the long linear nostril placed near the base, at the bottom of the groove on the upper mandible; the tarsi are rather short and stout and scutellated throughout; posterior toe present; anterior toes not joined together with webs; the wing is long with first primary longest.

One species of the genus occurs in India and the genus itself is almost cosmopolitan.

(2162) Calidris tenuirostris.

The Eastern Knot.

Totanus tenuirostris Horsf., Trans. Linn. Soc., xiii, p. 192 (1821) (Java).

Tringa crassirostris. Blanf. & Oates, iv, p. 277.

Vernacular names. None recorded.

Description.— Breeding plumage. Whole head black, each feather streaked laterally with white, broader on the hind-neck; back black, each feather narrowly edged with rufous-white and with a little rufous marking; scapulars with broad chestnut markings on both webs; lower back brown, the feathers edged with grey; upper tail-coverts barred black and white; tail-feathers grey-brown, pale-edged and the lateral also pale-shafted;

wing-coverts brown, edged with whitish and with darker centres and shafts; primary coverts and primaries blackish, the latter white-shafted and with paler inner webs; outer secondaries paler and inner secondaries darker again, the former with broader white edges, the latter with rufous-white edges; sides of head, chin, throat and fore-neck white streaked with black; upper breast black with very fine white edges; lower breast and posterior flanks white with blackish spots; centre of abdomen pure white; under tail-coverts white, lightly spotted with black; axillaries white with contour-lines of light brown.

Colours of soft parts. Iris dark brown, bill dusky-black; legs and feet greenish-dusky (*Armstrong*).

Measurements. Wing 165 to 185 mm.; tail 63 to 69 mm.; tarsus 34 to 38 mm.; culmen 39 to 47 mm. It is possible that there are two races of this bird, though it is impossible to divide them until the breeding-haunts are known. Indian birds have the wing from 176 to 185 mm., whilst Burmese and Malayan birds have it only 165 to 175 mm.

In Winter the upper parts are pale greyish-brown; each feather with dark shafts, broadening to streaks on the head and neck; longer feathers of the mantle and scapulars with white-edged tips; chin and throat pure white; sides of head and neck, fore-neck, upper breast and flanks white spotted with brown; remainder of lower plumage pure white.

Distribution. In Summer Central and Eastern Siberia to Japan. In Winter it is found South in India, the Malay Archipelago and East to Australia. In India it has been obtained on the coasts of Sind and Baluchistan South to the Laccadives on the West coast; near Calcutta and at Madras on the East coast; on the Andamans and the coasts of Burma.

Nidification unknown.

Habits. Nothing recorded. In India it occurs in small flocks and singly on the mud-flats on the sea-shore and on migration from Siberia on the Chinese Eastern coasts in very large flocks.

Genus LIMICOLA.

Limicola Koch, Syst. baier. Zool., p. 316 (1816).

Type by mon., *L. pygmæa*=*L. falcinellus* Pont.

This genus differs from *Calidris* in its bill, which is soft and flexible, slightly swollen at the base and depressed and broad; the nostrils are small and placed in a groove near the base; tarsus and toes as in *Calidris*; tail short and nearly square, the central rectrices a little longer and pointed; wing long and pointed with first primary longest.

The genus contains but one species.

Limicola falcinellus.

Key to Subspecies.

A. Upper parts less brighly coloured rufous in breeding plumage	*L. f. falcinellus*, p. 245.
B. Upper parts more brightly coloured rufous in breeding plumage	*L. f. sibirica*, p. 246.

(2163) Limicola falcinellus falcinellus.

THE BROAD-BILLED SANDPIPER.

Scolopax falcinellus Pontopp., Danske Atl., i, p. 263 (1763) (Denmark).

Tringa platyrhyncha. Blanf. & Oates, iv, p. 279 (part.).

Vernacular names. None recorded.

Description.—Breeding plumage. Lores blackish; short supercilium white, streaked with blackish; upper parts velvety-black, feathers of crown with a few white edges; hind-neck duller and more streaked with paler brown; mantle with dull pale rufous notches and bold white edges to each feather; the innermost secondaries with rufous edges; lower back brown, the feathers pale-edged; upper tail-coverts blackish tipped rufous, the lateral feathers barred black and white; wing-coverts dark brown, edged paler; primary coverts and primaries black, the latter with white shafts and with the finest of white tips and edges, soon abraded; outer secondaries paler brown with broader white margins; anterior ear-coverts dark brown; rest of sides of head and neck white or fulvous-white, streaked and spotted with dark brown; centre of chin immaculate; sides of chin, throat, flanks and breast whity-grey, spotted with black and sometimes tinged rufous; abdomen, axillaries and under tail-coverts white, the last streaked with brown or black.

Colours of soft parts. Iris dark brown; bill horny-black or brown, strongly tinged with olive-green; legs and feet yellowish-grey with darker joints, toes dull olive-greenor olive-plumbeous.

Measurements. Wing 101 to 110 mm.; tail 35 to 40 mm.; tarsus 21 to 23 mm.; culmen 27 to 36 mm.

In Winter. Upper parts brown, each feather fringed with greyish-white; wing-coverts with still broader fringes; rupm and upper tail-coverts black with narrow edges of rufous, giving a barred appearance; under plumage white, the sides of the head and neck, the fore-neck and upper breast more or less streaked with dark brown.

Young birds are similar to the adult in breeding plumage but have the breast suffused with buff and the cheeks and sides of the head buff instead of white; the lesser coverts are blackish edged with rufous.

Nestlings. Upper parts rufous and black, speckled with white; forehead white; a broad median coronal streak black and another black line from lores to eye; sides of head and moustachial streak rufous; lower parts white suffused with buff on the breast.

Distribution. From Scandinavia to West Siberia. In Winter South to the Mediterranean countries, Red Sea, Pamirs and India. In the latter country it is found only in Sind and on the Mekran coast.

Nidification. The Broad-billed Sandpiper breeds during early and middle June in its Southern range and up to the middle of July in the more Northern. It may be found at practically sea-level and again up to 4,000 feet wherever there is sufficient swampy ground, making its nest in some dry, slightly-raised patch, well concealed in a tuft of grass or other herbage. The hollow selected is well lined with dry bents, leaves or the two mixed. The eggs are a pale stone, yellow-grey or buff in ground-colour, but in most eggs this is almost or quite covered with innumerable tiny specks of deep brick-red. In a few eggs the markings are bolder and sparser and in these they are nearly always more numerous at the larger end, where they form a cap. One hundred eggs average 32·0 × 22·8 mm.: maxima **35·2** × 23·2 and 31·8 × **24·8** mm.; minima **28·7** × 22·7 and 32·5 × **21·0** mm.

Habits. This Stint is essentially a bird of the sea-shore and the mouths of big rivers and creeks and is seldom found inland. It prefers mud or mud and sand mixed rather than pure clean sand and feeds much on surface-matter, seldom probing into the mud for its food like so many Waders. They feed on all kinds of insects, small shell-fish, worms and seeds of various kinds. It is a sociable little bird, generally found in flocks, whilst single birds and pairs associate with other Waders. Ticehurst noticed that a pair of non-breeding birds remained all the year round in Sind.

(2164) Limicola falcinellus sibirica.

THE EASTERN BROAD-BILLED SANDPIPER.

Limicola sibirica Dresser, P. Z. S., 1876, p. 674 (China).
Tringa platyrhyncha. Blanf. & Oates, iv, p. 279 (part.).

Vernacular names. None recorded.

Description.—Breeding plumage. Similar to the preceding race but with the upper parts much more rufous, each feather being boldly spotted and streaked with bright rufous.

Colours of soft parts as in the typical race.

Measurements. Almost exactly as in the preceding bird. Wing 100 to 111 mm.; culmen 28 to 38 mm.

In Winter plumage indistinguishable from the Common Broad-billed Sandpiper.

Distribution. Eastern Siberia from about Lake Baikal to the extreme East. Exact breeding area unknown. In Winter it migrates to Japan, China, the Malay Archipelago, Indo-Chinese countries, Burma, Malay States, Assam, Eastern Bengal to Ceylon. East to Australia.

Nidification unknown.

Habits. Very little recorded but apparently much the same as those of its Western relative.

Subfamily PHALAROPINÆ.

In this family the toes are bordered throughout by a web divided into lobes very much as in the Coots and Grebes. In other respects they are similar to birds of the genus *Erolia*, but unlike them, the female is bigger and more richly coloured than the male, the latter performing the duties of incubation.

The subfamily contains three genera, each consisting of a single species. Two genera and species are found in India during the cold weather.

Key to Genera.

A. Bill flat, broader than the tarsus and broader than high .... PHALAROPUS, 247.
B. Bill slender and subcylindrical, anteriorly narrower than the tarsus .... LOBIPES, p. 249.

Genus **PHALAROPUS**.

Phalaropus Brisson, Orn., i, p. 50, vi, p. 12 (1760).

Type by taut., *Tringa fulicaria* Linn.

Characters those of the subfamily; the wings are long and pointed with the first primary longest; the tail moderate and nearly square; the tarsus scutellated all round; a hind toe present; the bill is short and straight, distinctly flattened or depressed and rather stout; the nostril is placed near the base of the bill in a well-defined groove.

Phalaropus fulicarius.

Tringa fulicarius Linn., Syst. Nat., 10th ed., i, p. 148 (1758).

Type-locality: Hudson Bay, North America.

This form differs from *P. f. jourdaini* in being darker and less rufous when in full breeding dress.

(2165) Phalaropus fulicarius jourdaini.

THE GREY PHALAROPE.

Phalaropus fulicarius jourdaini Iredale, Bull. B.O.C., lxii, p. 8 (1922) (Spitzbergen).
Phalaropus fulicarius. Blanf. & Oates, iv, p. 282.

Vernacular names. None recorded.

Description.—Female in breeding plumage. Face blackish-grey; crown and nape black; sides of head white; centre of hind-neck grey, sides deep rufous; mantle velvet-black, the feathers broadly edged with pale rufous or creamy-buff, forming two fairly definite lines down the scapulars; lower back and rump grey in the centre, white laterally; upper tail-coverts rufous, marked with black and white on a few of the central feathers; tail-feathers grey, almost black at the tip, edged with whitish and the two penultimate pairs marked with rufous; wing-coverts grey edged with white, the tips of the greater forming a white wing-bar; primary coverts and primaries dark brown, the latter with white shafts and a few of the later feathers with white edges to the base of the outer webs; outer secondaries brown narrowly edged with white, the central almost all white and the innermost long ones like the mantle; chin grey-black, axillaries and under wing-coverts white; remainder of lower plumage deep rufous, generally with a plum tinge from lower breast to vent.

Colours of soft parts. Iris dark brown; bill dark horny-brown, orange at the base; legs and feet dull brown or fleshy-brown.

Measurements. Wing 129 to 142 mm.; tail 56 to 65 mm.; tarsus 20 to 23 mm.; culmen about 20 to 24 mm.

Male in breeding plumage. Similar to the female but the head duller, the feathers of the crown with rufous edges; the patch of white on the sides of the head smaller and mixed with rufous and white; lower surface often mixed with white. The male is a little smaller than the female. Wing 126 to 135 mm. (*Witherby*).

Male and female in non-breeding plumage. Forehead, supercilium, sides of head and neck and whole lower plumage white; hinder crown and nape blackish-brown or brown, running in a line down the hind-neck to the extreme upper back; mantle grey with very fine white edges to the feathers and darker shafts; tail and wings as in breeding plumage.

Young birds are like the male in Summer but have white foreheads and duller crowns; the chin to breast is rufous-buff fading to white or buffy-white on the remainder of the lower parts.

Nestling in down. Line from the forehead and crown black, centre of nape dull black: forehead buff, lateral coronal lines pale yellowish-buff; upper parts cinnamon-buff mixed with black and whitish; dorsal line and lines on flanks black; a narrow black eye-streak; chin, throat and upper breast yellowish-white, remainder of under surface greyish-white.

Distribution. Breeds in the Arctic regions from Iceland and Spitzbergen to Eastern Siberia, its place being taken in the American Arctic by the typical form. In Winter it migrates to the Mediterranean countries, Northern Africa and has once occurred in India, Blyth having obtained a single specimen in the Calcutta bazaar.

Nidification. The Grey Phalarope breeds from the middle of June to the middle of July, making a deep depression in the moss or soil well lined with a thick pad of grass and nearly always sheltered by a thick tussock of grass, a tuft of *salix* or even by an outcrop of rock. The site selected is close to water, a favourite one being a small island in lakes, fiords or open water in swamps. The eggs normally number four, occasionally only three and are very like Stint's eggs. The ground-colour varies from pale stone to a warm rather brown buff blotched, spotted or speckled with blackish-brown or chocolate-brown with sparse underlying spots of grey and pale plum-colour. The average of 155 eggs (*Jourdain*) is 30·4 × 21·8 mm.: maxima **33·8** × 21·2 and 30·5 × **24·5** mm.; minima **27·5** × 20·6 and 28·5 × **20·5** mm.

Habits. The Phalaropes differ from all other small Waders in their love of swimming, often being seen floating lightly on the top of the water, or swimming with little jerks and bobs like the Coots. They feed principally on insects, tiny crustacea and mollusca and also to some extent on algæ and shoots and seeds of other vegetation. They are very tame and confiding, tripping daintily about within a few feet of the observer, picking insects here and there off the grass and making little dashes after others on the move. Their alarm-note is syllabified by Miss Haviland as "drrrt drrrt" but, when in flocks, they keep up a pleasant little twittering chatter.

Genus **LOBIPES.**

Lobipes Cuvier, Règne Anim., i, p. 495, "1817"-1816.

Type by mon., *Tringa lobata* Linn.

This genus differs principally from *Phalaropus* in having a much more slender bill, no broader than high and almost cylindrical.

(2166) Lobipes lobatus.

The Red-necked Phalarope.

Tringa tobata ("t" error of type, corrected p. 824) Linn., Syst. Nat., 10th ed., i, p. 148 (1758) (Hudson Bay, N. America).
Phalaropus hyperboreus. Blanf. & Oates, iv, p. 281.

Vernacular names. None recorded.

Description.—Female in breeding plumage. Upper plumage dark grey-brown, the scapulars, innermost secondaries and tail darker, each feather edged outwardly with rufous, those on the secondaries and back sometimes obsolete; sides of the rump and lateral tail-coverts whitish; central tail-feathers blackish, the lateral rather paler brown edged with white; wing-coverts dark blackish-grey, the greater broadly edged with white, forming a wing-band; primary coverts and primaries blackish, the latter with white shafts: outer secondaries blackish edged with white; chin, throat and lower sides of head white; sides of neck rich rufous extending in a band round the fore-neck; sides of breast, sometimes meeting below the chestnut band, grey; flanks, axillaries and under wing-coverts mottled white and grey; remainder of lower plumage white.

Colours of soft parts. Iris deep brown; bill dark horny-brown to black; legs and feet pale plumbeous or lavender-blue.

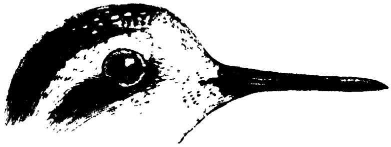


Fig. 41.—Head of *L. lobatus.* $\frac{1}{1}$.

Measurements. Wing, ♂ 105 to 111 mm., ♀ 110 to 118 mm.; tail 42 to 47 mm.; tarsus about 19 to 21 mm.; culmen 20 to 24·5 mm.

Male differs from the female in having the chestnut of the sides of the neck divided by dark grey on the fore-neck.

In Winter the upper plumage is grey, the feathers of the mantle edged with white; back, rump and upper tail-coverts blackish-grey; wings dark brown, the white wing-bar very conspicuous; forehead, fore-crown, face and sides of the head white; posterior crown blackish-brown; a patch round the eye, running down the ear-coverts, blackish: sides of breast grey; remaining lower parts white.

Young birds have the upper plumage black or nearly so, the feathers of the mantle narrowly edged with warm or pale buff; crown dark brown, extending in a line down the back of the neck; a dark brown line round the lower part of the eye extending over the ear-coverts; sides of head and neck, chin, throat and lower plumage white, the sides of the breast brown or grey-brown.

Nestling in down. Similar to that of the Grey Phalarope but more richly rufous and without the black line from the forehead to the crown.

Young birds moult direct from the juvenile plumage into the breeding plumage and do not assume an intervening Winter dress but, on the other hand, a good many birds appear to breed in a semi-mature dress, getting a partially red neck and grey breast but retaining the rest of the juvenile plumage.

Distribution. Breeding circumpolar. In Europe South to the Orkneys, South Norway, Sweden, Finland, Russia East to Commander Island and throughont Northern America from Alaska to the Yukon. In Winter it migrates South to North Africa and in Asia to India, Malaya, China and Japan.

Nidification. The Red-necked breeds Phalarope in Subarctic regions round the world, coming farther South for this purpose than the Grey Phalarope. Its breeding-habits otherwise differ but little from those of that bird, though its nest is often placed in among coarse grass growing in a foot or two of water, the grass being beaten down and then added to so as to form a neat dry cup. On the other hand, when in drier spots nothing is added as lining and so the nest is very primitive. The eggs only differ from those of the Grey Phalarope in being on an average smaller and less boldly marked and richly coloured; at the same time many eggs are quite indisguishable. One hundred eggs average 29·6 × 20·9 mm.: maxima **32·0** × 21·3 and 31·0 × **22·2** mm.; minima **26·7** × 19·7 and 26·6 × **19·3** mm.

The breeding-season commences in the middle of May in the Orkneys, June and early July in Scandinavia.

Habits. Similar to those of the preceding species. It is just as tame and fascinating a little bird to watch and, even when incubating, the little cock-bird will step off the nest, feed round about for a few minutes and then settle himself down again quite oblivious of the fact that he is being watched all the time.

Subfamily SCOLOPACINÆ.

The Woodcocks and Snipe differ from the other subfamilies of the *Scolopacidæ*, as indeed from all other *Charadriidæ*, in having the eyes placed very far back in the head, the ear-orifice being just beneath the hinder edge of the orbit. The toes, as in *Erolia*, have no webs; the bill is long, slender and very sensitive, the tip slightly swollen and provided with nerves; the tarsus is short, not exceeding the middle toe and claw in length.

The genus *Rostratula*, which has generally been included in this group, has now been shown to possess affinities which are more Ralline than Scolopacine and has therefore been removed (see *ante*) to a group by itself. The Jack-Snipe, which was included by Blanford in the genus *Gallinago*, has, in agreement with the general opinion of systematists, been removed to a genus by itself, *Lymnocryptes*, whilst, most unfortunately, the name of the genus *Gallinago* has had to be changed to *Capella*.

Key to Genera.

A. Tibia feathered throughout; no longitudinal pale stripes; occiput and nape transversely striped .... SCOLOPAX, p. 252.
B. Tibia partly naked.
  a. Crown with longitudinal stripes and median pale band; tail-feathers rounded. CAPELLA, p. 254.
  b. Crown with no median pale band; tail-feathers pointed .... LYMNOCRYPTES, p. 265.

Genus **SCOLOPAX.**

Scolopax Linn., Syst. Nat., 10th ed., i, p. 145 (1758).

Type by mon., *Scolopax rusticola* Linn.

In the genus the bill is long, slender, rather soft and swollen at the tip; both mandibles grooved, the linear nostril being placed at the base of the upper; the gape is forward of the base of the culmen; wings long with first primary longest; tail-feathers twelve in number, short and soft in texture; legs short, feathered to the joint of the tarsus.

Only one species, the typical form, is found in India.

(2167) Scolopax rusticola rusticola.

THE WOODCOCK.

Scolopax rusticola Linn., Syst. Nat., 10th ed., i, p. 145 (1758) (Sweden).
Scolopax rusticula. Blanf. & Oates, iv, p. 283.

Vernacular names. *Simtitar*, *Tutitar* (Hind.); *Sim Kukra* (Kuman and Nepal); *Chinjarole* (Chamba); *Daodidap gadeba* (Cachari); *Simpookhlaw* (Khasia); *Kangtruk* (Manipur); *Wilati Chaha* (Chittagong); *Bumpal* or *Dhabha* (Chitral); *Gherak* (Drosh); *Chustruck* (Gilgit).

Description. Forehead and sinciput grey, generally with a dark mark on the forehead; occiput and nape with three broad transverse bands of velvet-black, divided by yellowish or rufous lines; a deep rufous-brown, almost black, line running from the base of the bill to the corner of the eye, a second similar line below eye and posterior ear-coverts; ear-coverts and cheeks grey, with numerous brown spots; upper parts and wing-coverts rufous-grey with numerous bars of brown and rufous, the lesser wing-coverts brown and rufous only and the scapulars broadly black on the inner and white, yellowish-white or pale grey on the outer webs; the primary coverts are rufous with bars of grey, finely edged with dark brown; the primaries and outer secondaries brown, the latter notched on the outer webs with rufous, the notches being palest on the outermost feathers; the quills are also margined with rufous at the tips; the inner secondaries are barred right across with alternate bands, broad and narrow, of rufous; rump and upper tail-coverts barred rufous and black or rufous-brown, as a rule on the longest coverts the terminal half is almost pure rufous; tail-feathers dark brown or black, notched or barred with rufous, tipped grey above and broadly silver-grey below; chin white or nearly so, remainder of lower parts dull greyish white, barred throughout with narrow rufescent bars which become darker and more numerous on the upper breast, often running into one another and forming dark patches; on the abdomen and flanks posteriorly the bars are sometimes centred with a paler tint.

Colours of soft parts. Iris deep brown, almost black; feet green-grey, livid-grey, or grey lead-colour, claws generally paler and more fleshy; bill dusky, base brown, paler and tinged with purple at the base of the lower mandible.

Measurements. Wing 183 to 219 mm.; the largest and smallest measurements are those of adult females; tail about 80 to 90 mm.; culmen 68 to 83 mm.; tarsus 36 to 41 mm. Weight 7 to 16 oz.; 14½ oz. (*Lambton*, Nilgiris); 16 oz. (*H. Baker*, Nilgiris); 14¾ oz. (*Moore*, Assam).

In many specimens the whole tone of the plumage is more grey than rufous; this phase appears not to be connected in any way with age or sex.

Young birds have the feathers of the mantle with more or less exposed brown bases and marked with buff and cinnamon-buff; the upper tail-coverts are more barred and want the buff tips; the underparts have the bars narrower and paler.

Nestling. General down rufous-buff; a blackish streak from the forehead through the eye; crown and nape chestnut-rufous, a dark streak from the eye to the crown; broad dorsal line, lateral lines joining under the uropygium, sides of neck, band down wing and one on flanks dark chestnut-rufous.

Distribution. Breeds throughout Northern and Central Europe and throughout Northern Asia to Northern Japan. South it breeds in the Himalayas and mountains of Northern China. In Winter it migrates to the Mediterranean countries of Europe, North-West Africa and South Asia to India, Indo-Chinese countries, China and South Japan.

Nidification. The Woodcock breeds in the Himalayas from about 8,000 feet up to at least 12,000 feet and probably a good deal higher. The earliest birds on the lower ranges commence to lay in the middle and end of April, whilst on the higher ranges they do not lay until June and continue to the end of July. The nest is merely a depression in the ground but it is always well bedded with dry leaves and nearly always well concealed among bracken, fern, brambles or other undergrowth. It chooses sites in forest, never in the open, and favourite places are rather thin forest with plentiful undergrowth close to streams. The hen-bird sits very close and seldom moves until almost trodden on and I have, myself, sat down within a few inches of a sitting bird for some ten minutes before she left her nest. The eggs, four in number as with all the Snipe, are broad ovals, occasionally slightly pointed; the colour varies from pale clay to deep buff and the markings from pale reddish-brown to dark chocolate with others underlying of lavender. The blotches are of some size but not numerous and are collected more thickly at the larger end. Fifty Indian eggs average 44·5 × 33·3 mm.: maxima **48·1** × 33·2 and 45·3 × **34·3** mm.; minima **42·3** × 33·1 and 44·5 × **31·7** mm.

When the young are hatched the mother bird frequently moves them from one place to another, grasping them between her thighs and her abdomen. This she does not only when disturbed but, also, when desiring to get them closer to the feeding-grounds. During the breeding-season the male bird has a habit of flying backwards and forwards in an arc, his feathers puffed out and alternately uttering a "croak and a squeak like a bat, but louder." This is termed rôding.

Habits. In India the Woodcock is merely a casual migrant to the plains, the great majority of the Himalayan birds being resident or merely moving to lower levels in the Winter. It is very crepuscular in its habits and seldom moves by day unless forced to do so. It feeds on insects of all kinds, small worms, grubs, beetles and tiny freshwater snails and its flesh is a great dainty for the table. Its flight is a curious, wavering one but it twists in and out of trees at a pace that is very deceiving and is, in consequence, a difficult bird to shoot. The majority of the birds in India, except in the North, are young birds and weigh light, giving the impression that Indian birds are smaller than those of Europe.

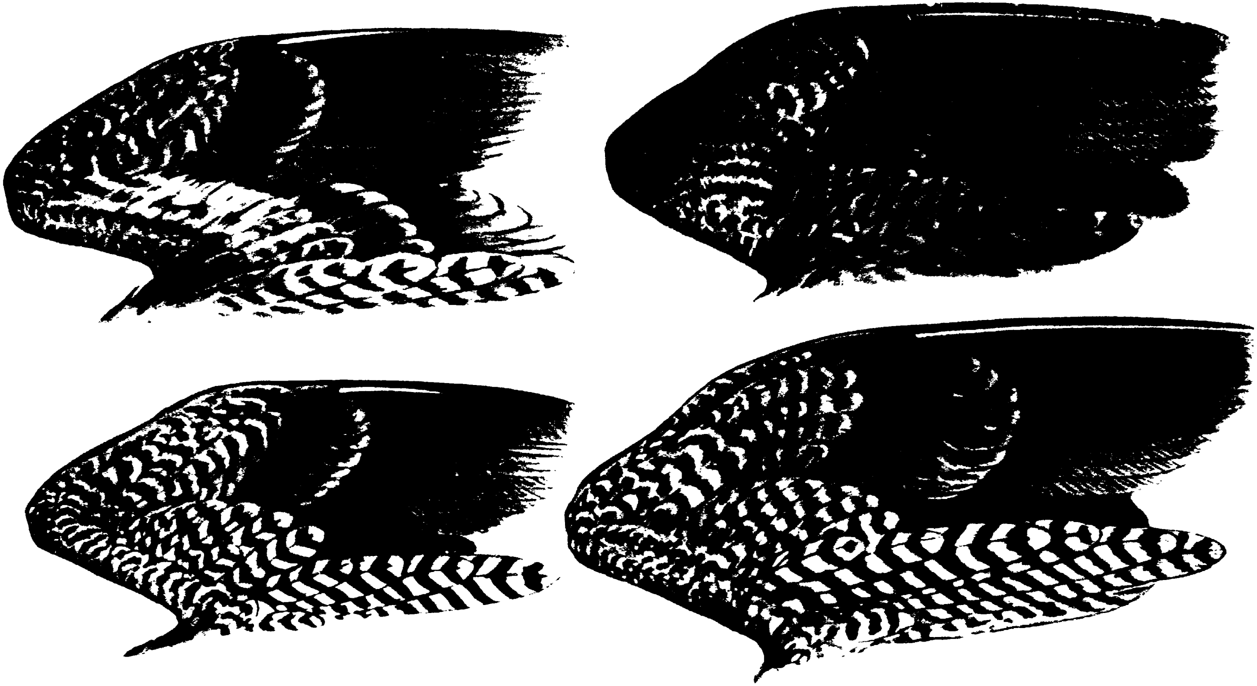
Genus CAPELLA.

Capella Frenzel, Beschr. Vög. Wittenberg, p. 58 (1801).

Type by mon., *Scolopax gallinago* Linn.

The true Snipes differ from the Woodcocks, *Scolopax*, in having a denser, harder plumage with a portion of the tibia bare, instead of feathered throughout; the wing is longer in proportion and less rounded; like the preceding genus the sternum has two emarginations; the head has longitudinal streaks instead of bars and the scapulars streaks instead of blotches; the tail-feathers vary greatly, from 14 to 16 in the Common Snipe to 26 in the Pintail Snipe; in all the tail is more or less fan-shaped but the actual shape of the feathers varies greatly in breadth.

The genus contains a great number of species which are cosmopolitan. Six species are known to visit India, some in enormous numbers, others only very rarely.



Under-surface of Wings of Snipe $\frac{5}{6}$

(1) *Capella g. gallinago.* (2) *Capella stenura.* (3) *Capella nemoricola.* (4) *Capella solitaria.*

Key to Species.

A. Wing exceeding 150 mm.; borders of scapulars white .... *C. solitaria*, p. 257.

B. Wing under 150 mm.; borders of scapulars buff or rufous.

- *a.* Distance between tip of shortest secondary and that of longest primary not exceeding 55 mm.............................. *C. nemoricola*, p. 255.
- *b.* Distance between tip of shortest secondary and that of longest primary exceeding 55 mm.
  - a'. Outer tail-feathers narrow and stiff and under 7·5 mm. broad.
    - a^2. Tail-feathers 26 in number, the eight outer on each side less than 5 mm. broad............................ *C. stenura*, p. 263.
    - b^2. Tail-feathers 20, the six outer on each side less than 7·5 mm. broad........ *C. megala*, p. 264.
  - b'. Outer tail-feathers not narrow or stiff.
    - c^2. Three outer pairs of tail-feathers marked with dusky spots and bars.......... *C. gallinago*, p. 259.
    - d^2. Three outer pairs of tail-feathers pure white .... *C. media*, p. 261.

(2168) Capella nemoricola.

THE WOOD-SNIPE.

Gallinago nemoricola Hodg., P. Z. S., 1836, p. 8 (Nepal); Blanf. & Oates, iv, p. 285.

Vernacular names. None recorded.

Description.—Adult male. Forehead brown, changing to black on the crown and nape; a rufous median stripe; supercilium and sides of the head white, fulvous-white or pale fulvous, speckled with brown and with broad brown bands running from the lores and from under the ear-coverts to the nape; chin white, generally unspeckled, sometimes faintly dotted with brown; upper back and scapulars velvety-black, the former near the nape much marked with rufous and the latter broadly edged with the same; lower back and rump duller black with rufous bars, more or less whitish in front on the former; upper tail-coverts barred rufous and blackish-brown, the former colour predominating; central tail-feathers black with two rufous bars and tips, the subterminal bars very broad; outer tail-feathers barred dull white and black; wings brown, the coverts edged and barred with fulvous, the primaries and primary coverts tipped with a pale edging, inner secondaries barred throughout with fulvous or fulvous-rufous; breast fulvous or fulvous-white barred brown; remainder of lower parts, *including the abdomen*, white barred closely with brown and with the under tail-coverts generally strongly tinted with rufous;

axillaries and under wing-coverts dark brown with narrow white bars.

Colours of soft parts. Irides dark brown; bill horny-brown, more or less tinged with green, the tip darker and the basal two-thirds of the lower mandible yellowish; legs dark plumbeous-green.

Measurements. Wing 133 to 141 mm.; tail 63 to 74 mm.; tarsus about 30 to 36 mm.; culmen 61 to 67 mm.; bill, depth at base about 12 to 13 mm. Weight "4·9 to 6·1 oz." (*Hume*), 6½ oz. (*Livesey*), 7 oz. (*Jerdon*).

Adult female. Does not differ from the male and is probably about the same in size or very little bigger, though with a longer bill. The two longest bills I have measured were 66 mm. and 66·5 mm. and both belonged to female birds.

Young bird. Judging from a single specimen of a young bird in the Indian Museum with a wing of 127 mm. and a bill of 59 mm., it would appear that in young birds the darker colours predominate over the paler more than in the adult. The dark bars on the lower plumage are distinctly broader and more close together, and the whole appearance in this specimen is far darker than I have seen in any adult bird; the feathers of the back and wing are very narrowly fringed with white.

Distribution. The Wood-Snipe is found in the Himalayas from Dalhousie on the west to the Southern Shan States on the East. In Winter it is found in the hills of Coorg, Wynaad, Nilgiris, Anamalis, Shevaroys etc., whilst on migration it has occurred at Calcutta, Bundelkhend, Serguja, Nasik, Dharwar and Mandla in the Central Provinces. It is comparatively common in the hills and adjacent plains of South Assam and wanders South in Burmah to Tenasserim. Birds from the Southern Shan States are very dark and dull and may eventually have to be separated but more material is badly wanted.

Nidification. The record of the eggs taken by Mandelli in Sikkim seems to refer to the Solitary Snipe and not to this bird. In the Khasia Hills a Wood-Snipe, trapped on her nest with four eggs on the 16th of June, was brought to me with one of the latter, the other three having been broken by the bird in her struggles. The nest was merely a pad of fine soft grass in a depression in bracken growing on the banks of a stream running through forest. The only egg saved is abnormally small, measuring 38·0 × 27·0 mm.; the other three were said to have been much bigger. In colour the egg is pale yellowish-stone with sparse primary blotchings of dark vandyke-brown and subsidiary ones of grey; at the larger end both markings form a dense ring.

Habits. The Wood-Snipe is probably a resident bird throughout the lower Himalayas from Garhwal to Yunnan and the Shan States between 6,000 and 2,000 feet. On the other hand.

specimens have been obtained up to 12,000 feet and again in the foot-hills of Assam and adjacent plains. It frequents the heaviest and densest of elephant-grass, reeds etc. growing either in swamps or on the banks of streams and is therefore a difficult bird to obtain and still móre difficult to observe. In parts of the Shan States it must be very common, as Capt. R. Livesey records shooting twenty in one day. Its flight is heavy, slow and wavering and, when disturbed, it flies only for a hundred yards or so and then flops into cover again. The only note I have heard is a guttural croak, uttered when first put up.

(2169) Capella solitaria.

THE EASTERN SOLITARY SNIPE.

Gallinago solitaria Hodgs., 'Gleanings in Science,' iii, No. 32, p. 238 (1831) (Nepal); Blanf. & Oates, iv, p. 290.

Vernacular names. *Bon Chaha* (Hind.); *Bharka* (Nepal): *Simpoo* (Khasia); *Daodidap gophu* (Cachari); *Boner kochu* (Assamese).

Description. Crown black, spotted with rufous and with a narrow white median band, often much broken up with brown; a broken supercilium narrowing behind the eye white, more or less mixed with brown; loreal streak dark brown, more or less mixed with rufous; chin, sides of head and throat white, speckled with dark brown and rufous, the centre of the throat almost pure white; neck all round rufous-brown, much mixed with white below, darker and less mixed with white above, but having also dark brown or black bars; back and scapulars black with numerous broken bars and spots of rufous, the scapulars with broad white outer edges, in some cases tinged with rufous; lower back deep brown with whitish tips and bars, rump with rufous spots; shorter tail-coverts dark brown with rufous bars and longer coverts almost uniform olive-brown, rayed darker and with white bars at the tips; wing-coverts brown, speckled with rufous next the scapulars and elsewhere barred with rufous and black and tipped with white; the edge of the shoulder is also barred with white; primaries dark brown, edged and tipped with white, the edges broadest on the outermost quill and almost disappearing on the innermost; secondaries dark brown, tipped white, with frecklings of rufous and black, which in the inner secondaries become regular bars throughout the whole length of the feathers; median tail-feathers black, tipped whitish and with a narrow black and a broad subterminal band of rufous; outer tail-feathers irregularly barred black and white; breast brown, more or less speckled and spotted with white, which forms into broad bars where the breast and abdomen meet; abdomen white, faintly barred at the sides; flanks, axillaries and under wing-coverts barred brown and white, the latter predominating; under tail-coverts white, sometimes practically unmarked, sometimes faintly barred with dusky brown and often with a faint rufous tinge.

Colours of soft parts. Irides dark brown; bill greenish-plumbeous, darkest at the tip, where it is almost black, and yellowish at the base of the lower mandible; feet and legs pale yellowish-plumbeous, the soles yellow-ochre and claws horny-brown.

Measurements. Wing 153 to 169 mm.; tail 55 to 63 mm.; tarsus about 28 to 38 mm.; culmen 66·5 to 76·7 mm.; depth of bill at base 8 to 9 mm. "Weight 5 to 8 oz." (*Hume*).

Distribution. From the Altai Mountains East to Manchuria and Japan, South to the Himalayas and Chin Hills. In Winter it straggles South to Cachar, Sylhet, the districts East of the Bay of Bengal and along the foot-hills of the Himalayas; one specimen was obtained near Benares (*Guthrie*) and a second near Devala in the Wynaad (*Fletcher & Hamilton*). In Burma it is not very uncommon either in the Chin Hills or in the Bhamo District.

Nidification. Very little known although it breeds over so great an area. Mandelli obtained its eggs from Singalila Ridge above Darjiling at an altitude of about 9,000 feet. These eggs are of a very pink tinge unlike any other Snipes' eggs. The ground-colour is a pinky-buff with bold blotches of rich maroon, blackish-maroon and brown mixed with others of grey. All these have a rather spiral appearance, looking as if laid on as the eggs revolved. Eggs in my own collection taken in Turkestan and Krasnoyarsk have no pink tinge and are like ordinary Snipes' eggs except in being much larger but two clutches taken from the same ridge as those brought to Mandelli have the pink tinge strong. The largest and the smallest of the few eggs I have been able to measure are respectively **45 0 × 30·2** and **40·2 × 28·3** mm.: the average of ten is 43·4 × 29·9 mm.

Habits. These Snipes are far more like the Common Fantail Snipe in flight etc. than the Wood-Snipe. They keep much to open patches in thin reeds and jungle or to patches of wet grass on the borders of swamps, though they are also sometimes shot out of ravines and water-courses in forest. They rise, like the true Snipe, with a similar, but louder and harsher "pénch," get away with a twist, fly fast and far before dropping but are less wild and will often lie until almost trodden on. They feed on all kinds of insects, small freshwater mollusca and land-snails, coleoptera and caterpillars. For the table they are excellent and much like the Common Snipe in taste. In the breeding-season they drum and bleat over their breeding-haunts like the Fantail, being found at this season between 9,000 and 15,000 feet.

Capella gallinago.

Key to Subspecies.

A. Under wing-coverts with a close barring of black and white; axillaries white, well barred with black .... *C. g. gallingo*, p. 259.
B. Under wing-coverts with a patch of white unbarred; axillaries white or only lightly marked.............................. *C. g. raddii*, p. 261.

(2170) Capella gallinago gallinago.

THE COMMON or FANTAIL SNIPE.

Scolopax gallinago Linn., Syst. Nat., 10th ed., i, p. 244 (1758) (Sweden).
Gallinago cœlestis. Blanf. & Oates, iv, p. 286 (part.).

Vernacular names. *Chaha* or *Chaha chiriya* (Hin.); *Chegga, Khada-Kocha* (Bengal); *Kocha Sorai, Chaha-Sorai, Chergya* (Assamese); *Bharak* (Nepal); *Chek-Lonbi* (Manipur); *Myay-Woot* (Burm.); *Chaha-Charai* (Ooriya); *Tibud, Pan-lawa* (Mahr.); *Mor-Ulan* (Tam.); *Muku-puredi* (Tel.); *Kaeswatua* (Cingalese); *Dao-didap* (Cachari); *Voh-ti-alin* (Kuki); *Ti-inrui* (Naga); *Ye-gnon* (Chindwin); *Pazimbon* (Kyauksé, Kachin Hills); *Lik pakhi* (Sind.).

Description. Crown to nape dark brown or blackish-brown, with a few specks of pale rufous; a broad median stripe and broad superciliaries reaching back to the neck pale rufous; a line from the bill through the eye and over the ear-coverts dark brown; sides of the head rufous speckled with brown; neck rufous blotched with brown and with two fairly definite lines of brown on lower throat and neck; chin and upper throat plain unspotted rufous; back velvety-black; the scapulars with broad pale rufous edges which form a longitudinal line down each side; upper back much speckled and barred with rufous, lower back barred with pale rufous; upper tail-coverts rufous barred with wavy lines of black and with obsolete shaft-streaks; tail black with narrow bars and a broad terminal band of rufous; lesser wing-coverts brown, tipped rufous, median coverts barred with rufous and brown, and greater-coverts brown with white tips; first primary brown with white outer web, other primaries brown with narrow white stripes, increasing in width on the innermost; secondaries barred brown and mottled with white on the inner web; breast dull buff or brownish, with dark brown bars; flanks the same; abdomen white; under tail-coverts rufous or buff and brown, the former colour predominating; lesser under wing-coverts white, much barred with brown, principally so on the edge of the wing; median under wing-coverts white, seldom with much barring; greater coverts brown with a broad white edge; axillaries white, more or less barred with brown.

Colours of soft parts. Iris dark brown; bill yellowish-horny or olive-yellow on the basal half, dark horny-brown to blackish on the terminal half; legs and feet dull olive-green or muddy-green, more yellowish in the breeding-season.

Measurements. Wing 127 to 142 mm.; tail 62 to 75 mm.; tarsus about 36 mm.; culmen 60 to 75 mm. Females possibly average a trifle larger in wing and bill measurement but the difference is very slight.

Young birds are like the adult but have pale, sometimes almost white fringes to the feathers of the mantle and wing-coverts.

Nestling. Down of upper plumage rufous-buff; a band across the forehead yellow-buff; crown freckled with black and with two broad bands of black on either side of the crown; a line through the eye and another on the cheek black; dorsal, median and lateral lines black, the down white-speckled at the tips; wings broadly marked with black and a black patch on the side of the breast and on the flanks; lower parts rufous-buff.

Distribution. Northern and North Central Europe to mid-Siberia, the Yenesei probably being the indefinite dividing line between the typical form and *C. g. raddii.* In India the whole of the continent to Ceylon, Assam, Burma and the Malay States but becoming more and more rare Eastwards.

Nidification. The Common or Fantail Snipe breeds as early as March and as late as July, many pairs probably having two broods, though the majority will be found laying in April and early May. The eggs are laid in depressions in tufts of grass and are generally well lined with beaten-down shreds of grass etc.; in some cases very good nests are made. As a rule the nest is well hidden but others are quite exposed. The site selected is one in a swamp or a damp meadow of thick grass, not necessarily very close to water and often at a considerable elevation. The full complement of eggs is always four and these vary greatly in colour and marking. The ground-colour varies from pale yellowish-stone, pale greenish or olive-green to dull brownish, olive or, rarely, dark clear green or buff. The markings may be blotches of dull brown more or less mottled all over, or they may consist of bold blotches and spots of blackish and chocolate-brown. In shape they are conical ovals, the texture close and the surface smooth or, even, glossy. One hundred European eggs (*Hartert*) average 39·6 × 28·8 mm.: maxima **42·7** × 29·0 and 39·6 × **31·0** mm.; minima **35·0** × 28·4 and 36·8 × **26·7** mm.

Habits. The Fantail Snipe is a migrant, arriving in India by twos and threes at the end of August and by innumerable thousands in September and October. The main trend of its earliest migration route seems to be through North-East India and then South and West, and secondly by a later migration through the North-West of India, this route being traversed by the vast majority of birds, so that in Ceylon and North-West India they arrive much later than in Bengal and Assam. The Snipe is the small game-bird, *par excellence*, of India. Rapid of flight and twisting strongly as he flies he is good to shoot; occurring in vast numbers he satisfies the most keen of sportsmen, whilst once shot he provides a *bonne bouche* for any epicure. Bags of 100 couple to one gun have often been made, on one occasion one gun having killed 131½ couple in one day. The note as the Snipe rises is a sharp "pénch," often the first notice that he is aflight. They feed on worms, grubs, insects, tiny snails and freshwater shell-fish, larvæ etc. but their digestion is so rapid that the examination of stomachs is difficult. In the breeding-season Snipe perform aerial evolutions, sinking to the ground in a curve, with tail stiffly spread so that the wind *drums* through them. Whilst performing thus the male makes a bleat curiously like that of a kid of a goat some distance away.

(2171) Capella gallinago raddii.

RADDE'S SNIPE OR THE EASTERN FANTAIL SNIPE.

Scolopax gallinago raddii Buturlin, 'Waders of the Russian Empire,' part i, p. 56 (1902) (E. Siberia).
Gallinago cœlestis. Blanf. & Oates, iv, p. 286 (part.).

Vernacular names as for the Common Fantail.

Description. Differs from the preceding bird in being somewhat paler above, the buff longitudinal stripes more conspicuous; the under wing-coverts often have a patch of white with no barring and the axillaries are pure white or nearly so.

Colours of soft parts and **Measurements** as in the typical form.

Nidification. Dresser gives the breeding range of this race as Siberia from Krasnoyarsk to Kamtchatka. To this I add the Himalayas. Birds obtained during the breeding-season from Kashmir are so scarce in collections that it is difficult to be certain what race breeds there but four birds I have seen, all females shot off their nests, have had pure white axillaries and a well-marked patch of white on the under wing-coverts. The Snipe is a very common breeder in Kashmir from 5,000 feet upwards, the nests and eggs being indistinguishable from those of the Western form.

(2172) Capella media.

THE GREAT SNIPE.

Scolopax media, Lath., Gen. Syn., Suppl., i, p. 292 (1787) (England)

Vernacular names. None recorded.

Description. Crown chocolate to black; a narrow buff median coronal line from the base of the bill to the nape; broad lateral coronal lines also buff; a narrow line through the eye black; neck buff streaked with black; back and scapulars black, spotted with buff and with two broad buff lines down the sides of the back; scapulars edged outwardly with buff and spotted and barred with buff or rufous-buff; lower back brown or blackish-grey, changing on the upper tail-coverts to rufous barred with black; tail black at the base, barred rufous and black on the terminal third and tipped paler; outermost tail-feathers nearly all white, penultimate pair white with rufous and black base; wing-coverts mottled black and rufous, tipped with white; primary coverts and primaries black, the former tipped white: a black patch under the eye across the ear-coverts, rest of the sides of the head and neck buff, speckled with black; chin and centre of throat pale buff, immaculate or slightly speckled; fore-neck buff streaked and spotted with blackish; breast and flanks buff barred with blackish; centre of abdomen white, immaculate or obsoletely barred; under tail-coverts darker rufous barred and streaked with chocolate or black; axillaries and under wing-coverts barred black and white.

Colours of soft parts. Iris dark brown; bill brown or horny-brown; legs and feet dusky-plumbeous or greenish-plumbeous.

Measurements. Wing 139 to 150 mm.; tail 50 to 62 mm.; tarsus about 32 to 36 mm.; culmen, ♂ 57 to 63 mm., ♀ 64 to 69 mm. Females are no smaller than males.

Nestling. Upper plumage rich chestnut-rufous; the centre of the crown, centre of back, patches on wing and sides of rump black, the feathers tipped white; line from forehead round eye fulvous: round the eye white; chin and throat bright fulvous; fore-neck dusky, remainder of lower parts rufous-fulvous.

Distribution. Breeding throughout Northern Europe and Western Siberia in Asia, certainly as far East as the Yenesei and probably considerably farther. In Winter it occurs throughout Africa to the extreme South, whilst in Asia it occurs in Palestine, Mesopotamia and Persia and straggles into India whence birds have been recorded thrice: Madras (*Derenham*); Bangalore (*Boxwell*); Arkenam, Madras (*Peters*).

Nidification. The Great Snipe bred in Holland until recently, but now no longer. It still breeds from Denmark and Scandinavia North to Tromso and East to the Yenesei during May and June. The nest is made in swampy ground among rushes and grass, generally in the open but occasionally among bushes and small trees. Most nests have no lining but some have a little fine grass or a few leaves. The eggs are always four in number and are in appearance just like large boldly-marked and handsome eggs of the Common Snipe but are much bigger. Jourdain gives the average of 100 eggs as 45·3 × 31·8 mm. The maxima are **49·5** × 31·8 and 46·2 × **33·3** mm.: minima **41·2** × 31·7 and 46·5 × **29·5** mm.

Habits. The Great Snipe, like others of its genus, is crepuscular in its habits, seldom moving by day. It frequents swamps, marshy fields and wet uplands and is often found on the outskirts of woods or, sometimes, in swamps with scattered trees and shrubs growing in them. Its flight is comparatively slow and heavy, the flapping being like that of the Woodcock without the turns and twists; as it rises it utters a low harsh croak. It is said to perform evolutions during the breeding-season like that of the Fantail Snipe and to make a sound like "Bip-bip, bipbip, bipbip peree biperee" when seated on the ground with tail widespread.

(2173) Capella stenura.

The Pintail Snipe.

Scolopax stenura Bonaparte, Ann. Stor. Nat. Bologna, iv, p. 335 (1830) (Sunda Is.).
Gallinago stenura. Blanf. & Oates, iv, p. 289.

Vernacular names. Few natives appear to recognize the difference between the Pintail and Fantail Snipes, and the vernacular names given to the latter apply equally to both. *Pazembon Kya* or *Ja* (Kyanksé, Kachin Hills).

Description.—Adult male. The Pintail Snipe differs from the Fantail in coloration in having the whole of the axillaries and under wing-coverts regularly barred throughout with black or brown and white, the former colour being predominant. The average bird is also duller and darker in its coloration; this more so on the lower than the upper parts. The bill is proportionately shorter and stouter, and the tail consists, normally, of 26 or 28 feathers, the external 8 or 9 on each side being very stiff and narrow, the outermost only about ·1 inch in width.

The outer web of the first primary is, in all text-books, said to be brown, but this is not quite correct, as in a large series one finds many specimens with very pale outer webs, though these may never be quite white.

Colours of soft parts. Iris deep brown; bill on the terminal third or half horny-brown or even blackish-brown, basal half dull olive-green, palest about the gape and extreme base; legs and feet yellowish-olive to dull olive-green or plumbeous-green.

Measurements. Wing, ♂ 125 to 134 mm., ♀, 130 to 138 mm.; tail about 54 to 68 mm.; tarsus 29 to 31 mm.; culmen, ♂ 57 to 61 mm., ♀ 59 to 64 mm.

The tail has 26 to 28 feathers but occasionally only 24 or, very rarely, 22.

Distribution. The Pintail Snipe breeds from the Yenesei to Eastern Siberia. Kuschel records it breeding in Eastern Turkestan and it possibly breeds through Northern Tibet and the plateaus of Northern China. In Winter it is found all over China, Indo-China, Burma and India to Ceylon, but it is much more common in the East than in the West of India.

Nidification. Prjevalsky records its breeding in Ussur choosing nesting-sites in thinly overgrown marshes; Kusche obtained three or four nests in Eastern Turkestan and Popham took several nests on the Yenesei River. The nests appears to be just like that of the Fantail Snipe and the eggs only differ in being rather larger. In India the Pintail Snipe normally does not breed at all, either in the plains or in the Himalayas, but odd birds, possibly such as have been peppered in the wings during the Winter, remain and breed. Hole found a nest in Cachar, another was found near the Rifle Butts swamp in Silchar and I took a nest with four and one with one egg in the N. Cachar Hills. Oviduct eggs from two birds were also obtained in Cachar in August. The only thirteen eggs I have been able to measure average 40·5 × 28·8 mm.: maxima 44·2 × 30·4 and 40·6 × 31·5 mm.; minima 37·0 × 28·5 and 39·5 × 27·0 mm.

On the Yenesei Popham found them breeding during the last week of May. He describes the "drumming" made by the Pintail as much louder than that of the Fantail and says that when close overhead the sound is "terrific."

Habits. Generally speaking, very similar to those of the Fantail Snipe but this bird with its much harder, less sensitive, bill often frequents dry grass-land, thin bush-jungle and other places in which no Fantail would ever enter. On the other hand, over much of its area in India it is found in company with this bird in rice-fields and marshes.

(2174) Capella megala.

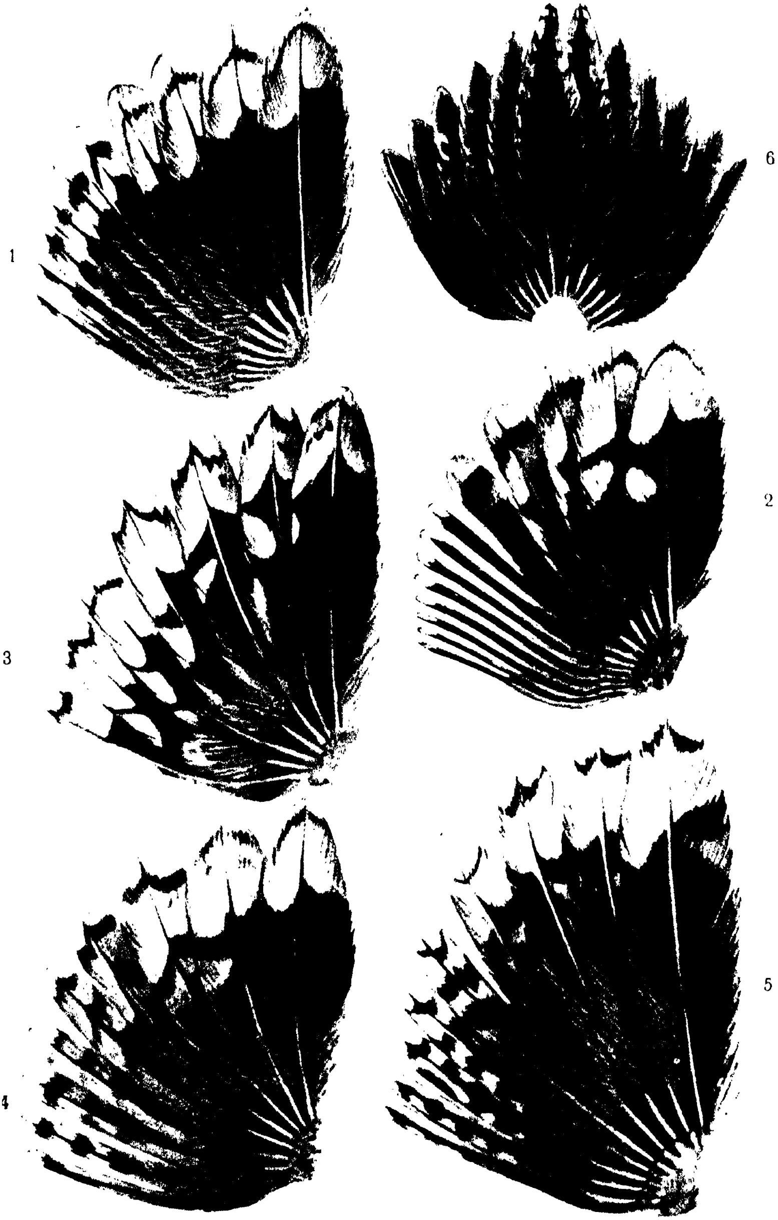
SWINHOE'S SNIPE.

Gallinago megala Swinhoe, Ibis, 1861, p. 343.

Description. Swinhoe's Snipe is in coloration indistinguishable from the Pintail Snipe, but can always be identified by an examination of the tail. This in Swinhoe's Snipe contains only twenty feathers, whereas the Pintail Snipe normally has twenty-six tail-feathers and practically never less than twenty-two. Even, however, when the tail is imperfect, discrimination is easy, for whereas the outer tail-feathers of the Pintail are hardly broader than a pin, those of Swinhoe's Snipe are never under 5 mm. Again, the Pintail has eight or ten of the central feathers non-attenuated, whereas Swinhoe's has only the six central ones showing no attenuation. The white tips to the tail-feathers are more conspicuous than in the Pintail Snipe.

Colours of soft parts. "Iris dark amber-brown; bill light yellowish-brown for the basal two-thirds, yellower on the base of the upper mandible, blackish-brown on the apical third; feet light yellowish-grey with blackish-brown claws" (*Swinhoe*).

Measurements. Wing 128 to 139 mm.; tail 52 to 57 mm.; tarsus about 32 to 34 mm.; culmen 59 to 74 mm.



TAILS OF SNIPE $\frac{5}{6}$

(1) *Capella megala.* (2) *C. stenura.* (3) *C. g. gallinago.*
(4) *Capella nemoricola.* (5) *C. solitaria.* (6) *Limnocryptes minimus.*

Young birds are distinguishable by their more uniform dark brown throat and neck; the stripes on the side of the crown are black without rufous mottling and the upper plumage has the feathers edged paler.

Distribution. Breeding in Eastern Siberia and Northern China. It occurs as far West as the Yenesei but the limits of its Southern breeding are not known. In Winter it migrates to South China, the Philippines, Borneo and the Moluccas. In India it was unknown until 1903, when I obtained a specimen in Lakhimpur. In 1908 a second was obtained in the Shan States. Since then records have been numerous, in 1912 no fewer than six being shot in the Chinglepat District of Madras. Probably it occurs yearly in some numbers in Madras and more often in Eastern India and Assam but is overlooked owing to its resemblance to the Pintail Snipe.

Nidification. Very little known. Smirnoff found it breeding on the Yenesei at the end of May 1921 and took three nests at Uskinskoe. The eggs are exactly like small eggs of the Great Snipe but one clutch of four and a single egg have a distinctly olive-green ground, whilst another single egg has it pale yellowish-stone. In all the markings consist of large blackish and vandyke-brown blotches, more numerous at the larger end with a few underlying ones of lavender and pinkish-grey. In shape they are rather more obtuse ovals than most Snipes' eggs. The six eggs average 40·3 × 28·3 mm. Buturlin also received eggs of this species taken in Eastern Siberia.

Genus LYMNOCRYPTES.

Lymnocryptes Kaup, Skizz. En. Nat. Syst., p. 118 (1829).

Type by mon., *Scolopax minima* Brunnich.

In this genus the central tail-feathers are pointed and project beyond the others, there is no median pale coronal stripe and the plumage of the back and scapulars has an iridescent gloss.

(2175) Lymnocryptes minima.

THE JACK SNIPE.

Lymnocryptes minima Brunnich, Orn. Boreal., p. 49, 1764 (Europe).
Gallinago gallinula. Blanf. & Oates, iv, p. 292.

Vernacular names. *Chota Chaha* (Hin.); *Chota Bharca* (Nepal); *Olan* (Tamil); *Tibad, Pan Kawa* (Mahrati); *Daodidap Gajiba* (Cachari).

Description.—Adult male. Crown to nape velvety-black, stippled with rufous, a very broad supercilium pale buff; sides of the head dull white marked with rufous-brown, and two broad brown streaks running from the bill, the upper through the eye, the lower under the ear-covert; hind-neck rufous, stippled with white and dark brown; back, scapulars and rump black, glossed with purple and green, varying in different lights, the outer webs of the scapulars buff, forming two bands and the inner webs more or less barred with rufous; upper tail-coverts and tail dark brown with rufescent-buff borders; lesser and median wing-coverts deep brown or black, with very pale buff or white bars; greater coverts dark brown tipped with white, wing-quills dark brown, the first primary pale on the base of the outer web and the secondaries tipped with white; chin white; neck, breast and flanks mixed white, brown and rufous, the brown predominating; abdomen and lower breast white, under tail-coverts with dark shaft-streaks; under wing-coverts white barred with brown on the edge of the wing; axillaries white, sometimes slightly barred with brown but generally pure white.

Colours of soft parts. Iris dark brown; bill-tip almost black, paling posteriorly to horny-brown and at the base to olive or greenish-horny, sometimes fleshy at the extreme base and gape; legs and feet pale olive-green, often tinged with yellowish or grey.

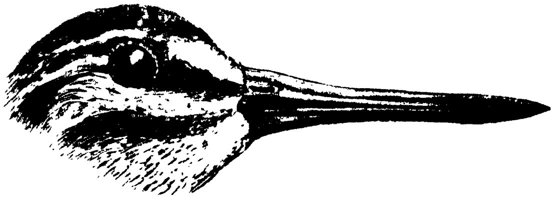


Fig. 42.—*L. minima.* $\frac{1}{1}$.

Measurements. Wing 106 to 116 mm.; tail 45 to 50 mm.; tarsus about 23 to 25 mm.; culmen 38 to 44 mm.

Distribution. Northern Europe and Asia. Migrating South in Winter to Northern Africa and the Mediterranean countries, Central Europe from England to Russia, Palestine, Persia etc. to India, Burma and, rarely, to China. It occurs in the Andamans, where it was shot by Osmaston and is not uncommon in Ceylon.

Nidification. The Jack Snipe breeds throughout Northern Asia and Europe. The nest is the usual depression made among grass in swamps, marshy fields and wet tundra; it is generally well lined with scraps of grass, equisetum, or birch leaves and nearly always carefully hidden. The eggs in a full clutch are generally four but occasionally three only and cannot be distinguished from those of the Fantail Snipe, though they average smaller and are, on the whole, of a duller brown colour. They vary, however, even more than those of the Common Snipe and in the Newton (Wolley) collection there are red-brown eggs like those of the Broad-billed Sandpiper, others like miniature eggs of the Great Snipe or the Reeve and yet others covered with grey-green spots unlike any known egg of a Wader. Two hundred eggs average 38·4 × 27·5 mm.: maxima **44·5** × 28·5 and 40·0 × **30·0** mm.; minima **35·0** × 27·0 and 38·0 × **25·4** mm.

The breeding-season lasts from late June to the end of August, most eggs being laid in July.

During the courting and breeding months the Jack Snipe make a noise likened by Wolley to a horse cantering in the distance over a hard road; the sound is made by the bird whilst it is descending from a great height after having flown in curves higher and higher until the necessary height has been reached. It is still doubtful how the sound is produced.

Habits. The Jack Snipe is nowhere so common in India as the Fantail or Pintail Snipes and is much more fond of frequenting small patches of thick cover in corners of paddy-fields and swamps than these birds. It flies at a great pace; but zigzags in a most erratic manner and drops sooner again to the ground than other Snipe. It is an equally delicate, if tiny, morsel for the table.

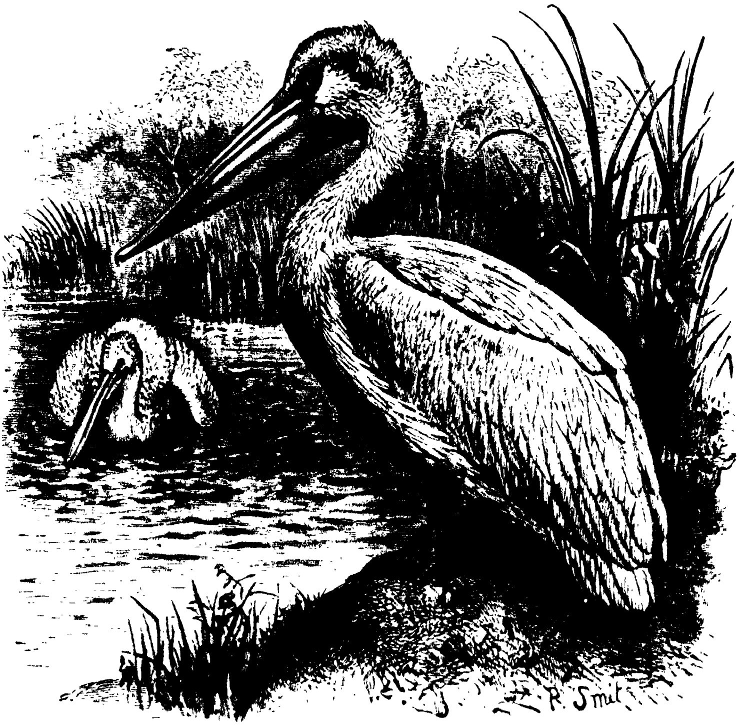


Fig. 43.—*Pelecanus crispus.*

Order X. STEGANOPODES.

Since the first edition of the Avifauna was issued and the equivalent of the present volume written by Blanford not much has been done to necessitate any great alteration of the classification then adopted and we can therefore leave it practically undisturbed. The Order contains the Pelicans, Cormorants, Gannets or Boobies, the Tropic-birds and the Frigate-birds. From the *Charadriidæ*, including the *Laridæ*, which are all desmognathous, the following orders all differ in being schizognathous; for this reason they might well have followed the *Raptores* in classification. However, as already explained, there is no system of classification in sequence devised or devisable and the *Steganopodes* are as well placed here as anywhere.

The principal characters of the Order are the following:—All four toes united by a web, the hind toe well developed, turned inwards and united with the inner toe; skull desmognathous and holorhinal; basipterygoid processes absent; angle of mandible truncated; furcula generally anchylosed to keel of sternum, least so in *Sula* and *Phaëthon*; oil-gland present and tufted; cæca variable; tongue rudimentary; deep plantar tendons united by a strong vinculum, only a slender portion of the flexor longus hallucis reaching the hallux; the wing is aquincubital; after-shafts rudimentary or wanting altogether; plumage of the neck continuous, without apteria.

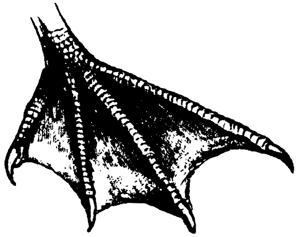


Fig. 44.—Foot of *Phalacrocorax niger*. ½.

The young are hatched blind, either naked or covered with down, but in all cases undergo a prolonged downy stage, during which they are helpless and are fed by their parents.

Key to Families.

A. Web between toes not emarginate; tail rounded or cuneate.	
a. Middle tail-feathers not greatly prolonged; nostrils not pervious.	
a′. Size very large; bill long, flattened, with a pouch extending its whole length	**Pelecanidæ**, p. 270.
b′. Size moderate; bill compressed, gular pouch small.	
a^2. Bill slender, subcylindrical or very elongate and pointed; nostrils small	**Phalacrocoracidæ**, p. 276.
b^2. Bill stout and conical, with no external nostrils	**Sulidæ**, p. 284.
b. Middle tail-feathers greatly prolonged; nostrils pervious	**Phaëthonidæ**, p. 290.
B. Webs between toes deeply emarginate; tail forked	**Fregatidæ**, p. 295.

Family PELECANIDÆ.

This family consists of a single living genus, *Pelecanus*, which is distributed throughout the tropical and temperate regions of the world. In this genus there are seventeen cervical vertebræ; the ambiens and other characteristic thigh-muscles are absent except the femoro-caudal; there are no syringeal muscles.

Genus **PELECANUS.**

Pelecanus Linn, Syst. Nat., 10th ed., i, p. 132 (1758).

Type by taut., *Pelecanus onocrocotalus* Linn.

In this genus the upper mandible is depressed; narrower and less flattened at the base, broader and more flattened towards the end; the upper mandible is composed of a median bar, convex externally, continuing the whole length of the bill and terminating in a strongly-hooked nail, whilst the two lateral portions are each marked off from the median bar by a narrow but distinct groove, in the base of which is situated the small nostril. The lower mandible is thin and consists of two flexible rami supporting a large pouch of naked membrane. The wings are broad but not long or pointed; tail short and nearly square: tarsus compressed and reticulate in front.

Three species occur in India, one of which is represented by two races.

Key to Species.

A. Feathers of forehead terminate in a point..	*P. onocrocotalus*, p. 271.
B. Feathers of forehead end in front in a transverse concave line.	
a. Wing over 640 mm.; culmen over 360 mm.	*P. crispus*, p. 273.
b. Wing under 630 mm.; culmen under 360 mm.	*P. philippensis*, p. 274.

Pelecanus onocrocotalus.

Key to Subspecies.

A. Tail-feathers 24. Generally rather larger	*P. o. onocrocotalus*, p. 271.
B. Tail-feathers 22. Generally rather smaller..........................	*P. o. roseus*, p. 272.

(2176) Pelecanus onocrocotalus onocrocotalus.

THE WESTERN WHITE OR ROSY PELICAN.

Pelecanus onocrocotalus Linn., Syst. Nat., 10th ed., i, p. 132 (1758) (Africa); Blanf. & Oates, iv, p. 334.

Vernacular names. *Hawasil*, *Gagunbêr*, *Gang Goya*, *Pear*, *Jalasind* (Hind.).

Description. Primaries black with white shafts; secondaries black but with much white on the outer webs, often extending to the inner also; there is also a sharply-defined but narrow black edging to the secondaries and sometimes to the scapulars; remaining plumage white, the whole head, neck and long crest suffused with rosy-pink, which extends to the back and scapulars and breast; at the base of the fore-neck the long lanceolate feathers are yellow-ochre or tan-yellow.

Colours of soft parts. Iris red to crimson; bill plumbeous-blue, mottled with white along the centre and with the nail and edges of both mandibles red; the lower mandible is blue on the basal, yellow on the terminal half; pouch, face and orbital skin yellow, brighter in the breeding-season; legs and feet fleshy-pink, the webs yellow.

Measurements. Wing, ♂ 700 to 730 mm., ♀ 640 to 680 mm.; tail 190 to 210 mm.; tarsus about 130 to 140 mm.; culmen, ♂ 430 to 450 mm., ♀ 390 to 400 mm.

Young birds have the head, neck, centre of back and underparts white, the head and neck much suffused with dull ferruginous; remaining plumage dull pale brown, the feathers edged paler, the quills and tail darker but with a silvery ashy tinge over the greater part of both webs.

Distribution. The Rosy Pelican breeds from Hungary, where it was formerly very common, to the lakes of Central Asia, whilst it winters in North Africa as far as the Zambesi and Mosambique, in Asia as far South as Mesopotamia, Persian Gulf and Northern India, where it occurs commonly in the extreme North-West only.

Where the breeding-ranges of the two races, the Western and Eastern, meet is still uncertain and Ticehurst was unable on the material available to say what species bred in Iraq. There is, however, evidence that many of the vast swarms occurring in Mesopotamia are winter visitors, migrating North for the breeding-season. These would appear to be true *onocrocotalus*. On the other hand, some Pelicans breed in Iraq (Mesopotamia) and there are breeding colonies near Fao on the Persian Gulf. Two chicks in the British Museum appear to be of the Eastern race, whilst eggs from the Cox-Cheeseman collection are decidedly small. It would seem, therefore, that the Fao colony is one of *P. o. roseus* and probably the Iraq breeding birds also.

Nidification. The Western Rosy Pelican breeds in large colonies in swamps and inland lakes during April and May, some pairs continuing to lay during June and early July. The nests are huge masses of sticks, rushes, grass and water-plants placed in among reeds in shallow water or in the mud and slush immediately surrounding the lakes. Two or three eggs are laid and very rarely four. These are white when first laid, with a thick chalky-covered texture like Cormorants' eggs and they soon become yellowish and stained. Dombrowski—quoted by Hartert—gives the average of one hundred eggs as 95·2 × 60·2 mm.: maxima **102·0** × 63·5 and 97·3 × **64·5** mm.; minima **80·0** × 54·1 and 82·3 × **53·3** mm.

Habits. This Pelican in its usual haunts collects in very large flocks but in India it occurs in much smaller numbers, its place being taken by the Eastern race. These great birds live entirely on fish, which they hunt into the shallows and then scoop up in their pouches. They fly well and at times may be seen soaring round almost with the lightness and elegance of Vultures, though their ordinary flight is a slow, dignified flapping, which, however, takes them through the air at a great pace. They utter a deep guttural squawk from time to time when swimming but are silent birds.

(2177) Pelecanus onocrocotalus roseus.

The Eastern White or Rosy Pelican.

Pelecanus roseus Gmelin, Syst. Nat., i, p. 570 (1789) (Manila); Blanford & Oates, iv, p. 333.

Vernacular names. Hind. same as the preceding bird; *Bellua*, *Borica* or *Bherua* (Behar); *Gara-polti* or *Gora-pallo* (Beng.); *Pian* (Sind); *Schawhet* (Burma).

Description. Differs from the preceding bird in having 22 tail-feathers instead of 24; it is slightly smaller; the difference between the sexes in size is even more marked and the frontal region is not so swollen.

Colours of soft parts as in the typical form.

Measurements. Wing, ♂ 680 to 720 mm., ♀ 600 to 653 mm.; tail 160 to 180 mm.; tarsus, ♂ 144 to 149 mm., ♀ 121 to 133 mm.; culmen, ♂ 390 to 425 mm., ♀ 313 to 365 mm.

Young birds are indistinguishable from those of the Western form.

Distribution. From Central Asia to the extreme East of Siberia and North China. Wintering in South China and the Philippines and the Indo-Chinese countries to Burma and India. The breeding colonies at Fao, and possibly in Mesopotamia, are those of this race. It is noticeable that Ticehurst records this race only as occurring in Sind, so that it must be the common form there, though typical *onocrocotalus* undoubtedly occurs also from time to time.

Nidification. So far as is known the nest and eggs and breeding-habits of these two races are the same but judging by the few eggs I have been able to measure, those of this race are much smaller. Fourteen eggs average 88·3 × 57·5 mm.: maxima **94·1** × **60·0** mm.; minima **83·1** × 58·0 and 89·0 × **55·0** mm. All the eggs taken by Cummings and later by Cox and Cheeseman were laid in the first three weeks of April.

Habits. Similar to those of the preceding bird. It occurs nowhere in the immense numbers that the Western bird does in some places, though Ticehurst records very large flocks in Sind. In this Province the local fishermen prize the oil obtained from the fat very highly and also eat the flesh. In Assam small flocks were not rare but often the birds were in pairs only, haunting the Brahmapootra and big rivers as well as swamps. In the rivers I have seen them hunting fish like Mergansers, forming a semicircle and driving the fish into shallows and backwaters, where they are easily caught. As a rule only the head and shoulders are thrust under water but occasionally the whole bird disappears. Although so ungainly on land and far from beautiful in the water, they present a fine sight when well on the wing.

(2178) Pelecanus crispus.

THE DALMATIAN PELICAN.

Pelecanus crispus Bruck., Isis, 1832, p. 1109 (Dalmatia); Blanf. & Oates, iv, p. 335.

Vernacular names. As for the preceding bird.

Description. Primaries and primary coverts blackish, the former with concealed white bases; outer secondaries brown with broad white inner edges; inner secondaries diagonally brown on the terminal halves with white edges all round; remainder of plumage silvery-white, the feathers of the back, scapulars, wing-coverts and shorter upper tail-coverts with black shafts.

Colours of soft parts. Iris white or yellowish-white; bill plumbeous-grey, the nail and edges of both mandibles yellow over the apical half; cheeks, orbital skin and pouch pale yellowish or creamy flesh-colour, the last deepening to orange-red in the breeding-season; legs and feet pale bluish-grey or plumbeous. Young birds have the bare portions of the face and pouch pale dull yellowish; iris pale dull yellow.

Measurements. Wing, ♂ 720 to 800 mm., ♀ 680 to 720 mm.; tail 220 to 230 mm.; tarsus 116 to 122 mm.; culmen, ♂ 400 to 450 mm., ♀ 360 to 380 mm.

Young birds have the head and neck white with brown bases to the feathers; under-plumage pure white; upper parts pale brown, most of the feathers with white centres; tail more or less brown, the bases of all and the inner webs of the lateral feathers with much white.

Distribution. Southern Europe from Hungary and Dalmatia, East to the Caspian Sea, Persia and thence to Northern China and South-East Mongolia. In Winter it migrates to Egypt, Nubia, Baluchistan, Northern India and South China. It is common in the North-West but occurs in Oude, Behar and Bengal and I have shot one specimen in Assam, whilst a second was obtained by Dr. Moore on the 5th of July at Dibrugarh.

Nidification as in the preceding races. Dombrowski gives the average of one hundred eggs as 93·3 × 58·1 mm.: maxima 102·0 × 58·1 and 96·0 × 64·0 mm.; minima 82·5 × 60·0 and 85·5 × 52·9 mm.

They breed during April and early May, bnt I have eggs taken in March and again in July in the delta of the Volga.

Habits. Those of the genus.

(2179) Pelecanus philippensis.

THE SPOTTED-BILLED PELICAN.

Pelecanus philippensis Gmelin, Syst. Nat., i, p. 571 (1789) (Philippines); Blanf. & Oates, iv, p. 335.

Vernacular names. *Deo-hans*, *Dhera* (Assam); *Bhela* (Kamroop); *Sekawet*, *Woonbak* (Burma); other provinces the same as for the preceding species.

Description in breeding-season. A ridge of elongated feathers down the back of the neck, lengthening to a small crest on the nape, brownish; remaining feathers of head and neck white with brown bases; primaries and primary coverts blackish with pale tips; secondaries and long scapulars brown with white bases and silvered over on the exposed outer webs; tail brown with the same silvering overlay; upper tail-coverts paler brown, strongly suffused with pink; remaining plumage white, the lower back, flanks, vent and under tail-coverts are suffused with vinous-pink; feathers of mantle black-shafted.

Colours of soft parts. Iris white to pale yellow, clouded with brown; bill pinkish-flesh or yellowish-flesh with a row of bluish-black spots on each side near the edge; the nail and terminal half of both mandibles orange, the lower mandible with bluish blotches near the centre; pouch dull purple blotched with bluish-black; naked skin orange-yellow, livid in front of the eye; legs and feet very dark brown or blackish.

Measurements. Wing, ♂ 530 to 607 mm., ♀ 525 to 550 mm.; tail 168 to 196 mm.; tarsus, ♂ 86 to 98 mm., ♀ 75 to 86 mm.; culmen, ♂ 324 to 355 mm., ♀ 285 to 308 mm

Adults in non-breeding plumage have the head, neck and back white; the rump, lower back, upper tail-coverts and flanks white with black shafts; wings and tail brown; lower plumage pale brown.

Young birds are pale brown throughout, the wing-coverts pale-edged and the breast and abdomen almost or quite white.

Distribution. The whole Oriental Region. Common in Burma and Eastern India South to Ceylon, less common in Western India.

Nidification. There are breeding-places of the Spotted-billed Pelican in the Carnatic, Ceylon and on the Godavery. In all these places they breed in the Cold Weather from December to March. There was formerly a breeding-place in Sylhet, possibly still existing, where they did not begin to lay until July, when the floods had commenced to rise. Their great breeding-haunts, however, are in the forest areas of Burma, where many years ago Oates found them breeding near Shwé-gyen in countless numbers during November. Civilization and cultivation have driven the birds back but they have merely retreated with the forest and still breed in their hundreds of thousands in company with the Adjutants as they did then in 1877. They make enormous stick-nests, often a hundred feet from the ground, high up in lofty trees, which are branchless for fifty feet or more from the ground. In some trees there may be ten to twenty nests, in others but one, whilst the breeding-area covers a belt of forest at least thirty miles long by three to ten miles wide. Fifty eggs average 78·8 × 53·4 mm.: maxima **83·0** × 54·2 and 81·5 × **57·8** mm.; minima **71·4** × **47·7** mm.

Habits. Except that these birds are very common over a very great area, the habits do not differ from those of the other Pelicans. In the non-breeding season the birds separate and spread out all over Burma and Indo-China and much of India, wherever there is enough water, swamp, lake or rivers in which they can fish. There are extraordinarily greedy birds and must destroy an immense weight of fish. They seem to prefer those which are up to about half a pound but will take much bigger ones, whilst they also take any unfortunate frogs, lizards or harmless snakes which may come their way. Their only note seems to be a deep guttural croak, which rises to a harsh screech when the birds are angry or frightened.

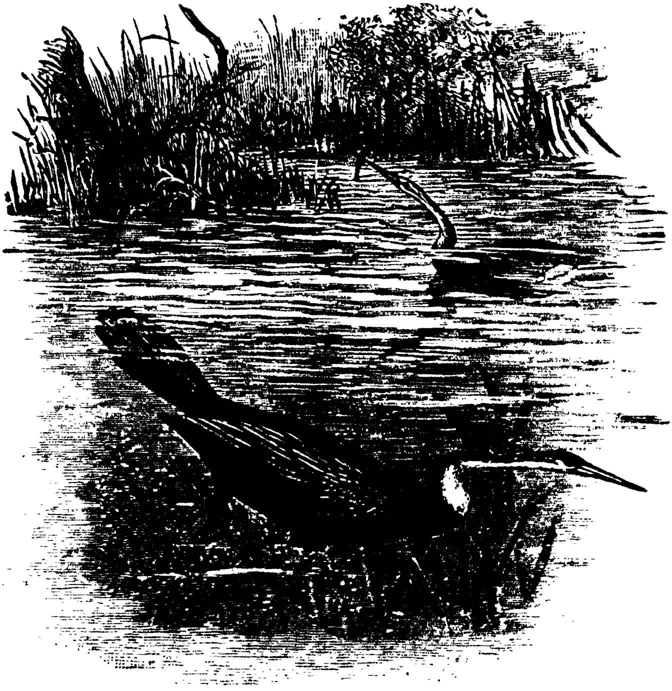


Fig. 45.—Head of *Anhinga melanogastra*.

Family PHALACROCORACIDÆ.

This family includes the Cormorants and Darters, or Snake-birds, diving fishers with black or blackish plumage on the upper parts and, very often, on the lower also. The neck is long, the bill rather long and slender; the nostrils are small and not pervious; cervical vertebræ 20; ambiens, femoro-caudal and semi-tendinosus muscles present; the two accessory thigh-muscles absent; syringeal muscles present.

There are two subfamilies, each containing in India a single genus, which are distinguished as follows:—

Key to Subfamilies.

A. Bill hooked at the tip; margins of commissure smooth .... *Phalacrocoracinæ*, p. 277.
B. Bill straight and pointed; margins toothed. *Anhinginæ*, p. 282.

Subfamily PHALACROCORACINÆ.

Genus PHALACROCORAX.

Phalacrocorax Brisson, Ornith., i, p. 60, vi, p. 511 (1760).

Type by mon., *Pelecanus carbo* Linn.

In this genus the bill is of moderate length, rather slender and compressed; the culmen is rounded and sharply hooked at the end, with a long narrow groove on each side, bifurcating at the dertrum or nail, the lower branch running down to the commissure; there is a gular pouch which is naked anteriorly; the wings are of moderate length, the second primary usually the longest; the tail is rounded or cuneate and consists of 12 or 14 very stiff feathers; the tarsus is short and compressed, the toes flattened and the claws much curved.

The genus is cosmopolitan and contains numerous species, of which three are found within our limits.

Key to Species.

A. Larger, wing over 310 mm.; tail of 14 feathers.	*P. carbo*, p. 277.
B. Smaller, wing under 300 mm.; tail of 12 feathers.	
a. Larger, wing over 250 mm.	*P. fuscicollis*, p. 279.
b. Smaller, wing under 220 mm.	*P. niger*, p. 280.

Phalacrocorax carbo.

Pelecanus carbo Linn., Syst. Nat., 10th ed., i, p. 133 (1758).

Type-locality: Sweden.

This species has been much split up into various races by different systematists and our Indian bird was separated by Mathews as *P. carbo indicus* in 1915 on account of its supposed difference in size. I can, however, see no difference between birds from India, the Indo-Chinese countries and China and retain them all under the name *P. carbo sinensis*, which differs from the European bird in its smaller size as well as in minor details of gloss and colour.

(2180) Phalacrocorax carbo sinensis.

THE INDIAN LARGE CORMORANT.

Pelecanus sinensis Shaw & Nod., Nat. Misc., xiii, p. 529 (1801) (China).

Phalacrocorax carbo. Blanf. & Oates, iv. p. 340.

Vernacular names. *Ghogur*, *Pan-kowa*, *Jal-kowa* (Hind.) *Tin-gyi* (Burm.); *Wadda Silli* (Sind.); *Bonta-kaki* (Tel.); *Di dao-kwa* (Cachari).

Description.—Breeding plumage. Head, crest, neck, whole lower plumage, lower back, rump and tail black with deep blue, green or purple gloss according to the light; a broad patch on the posterior flanks white; lores, anterior sides of face, skin and throat white; over the whole head and neck are pure white silky plumes almost hiding the black; mantle and the whole wing, excluding the black primaries, bronze-brown, each feather edged boldly with black.

Colours of soft parts. Iris green; bill dark horny-brown, the lower mandible except the tip pinkish or yellowish-white; skin of pouch black and yellow, patched in varying degree, occasionally all yellow; eyelids dusky yellow; legs and feet black.

Measurements. Wing 315 to 336 mm.; tail 136 to 149 mm.; tarsus 65 to 76 mm.; culmen 63 to 74 mm., generally 67 to 71 mm.

In Winter the white filaments of the head are shed and the white patch on the flanks also disappears.

Young birds are dull brown above, the feathers of the mantle with pale edges, soon abraded, and dark sub-edges; the chin, throat, centre of neck, the breast and middle of the abdomen white, the sides mottled with brown.

At a later stage the back attains the bronze-brown plumage with black margins; the lower part assumes a darker tint and the tail is black; by the fourth moult in Spring the fully adult breeding plumage is attained.

Nestling in down all dark sooty-brown. When first born they are naked with a black skin.

Distribution. Japan, China, the Indo-Chinese countries, Malay Peninsula and Archipelago, Burma, India and Ceylon.

Nidification. The Large Cormorant breeds in Burma and India during the Cold Weather months, mostly from November to the end of January. They make their nests in colonies, either on low trees in swamps, or on rocks by the sides of rivers. There is one colony in Assam on the Sabansiri River, where this bird breeds in many thousands during December, on the great rocks and precipitous cliffs which line the long and narrow gorge where this river debouches from the Himalayas. Everywhere the cliffs are whitened to a height of some thirty feet by the droppings of centuries, for the natives say that these birds have bred there "since the world began." In some places the nests jostle one another on convenient ledges of rocks, in others they are scattered about some feet away from one another but for over half a mile on each side of the river there are but few spots from which one is not able to see some forty or fifty nests. They are of some size, well made of sticks and lined with grass and water-weeds. Here the eggs number from three to six; in other colonies seven are sometimes laid but four and five are normal. They are, like all Cormorants' eggs, a pale clear sea-blue, but the whole surface is covered with a dense chalky covering of white. This calcium deposit, however, often breaks away in flakes, showing the blue below. One hundred eggs average 60·6 × 39·2 mm.: maxima **63·7** × 40·1 and 62·4 × **41·6** mm.; minima **56·2** × 37·0 and 59·8 × **36·9** mm.

The birds sit very close and when disturbed utter a very loud croaking bay, almost a roar. The young when first hatched are hideous little things, more like nightmares than birds.

Habits. Our Indian Cormorants are birds of fresh water rather than of sea-coasts like their European cousins and may be found in the non-breeding season on most large rivers and swamps. They live almost entirely on fish but any small reptile is also snapped up. They fish either singly, chasing their prey under water with extraordinary speed, or they fish in company. In the River Sabansiri I have seen companies of three or four hundred birds forcing the fish up backwaters and into the shallows by forming into a compact semicircular phalanx of swimming and diving birds. They gorge enormous numbers of small fish and many of some size, though anything over about half a pound is exceptional. If frightened and hustled they disgorge these before flighting but if undisturbed they eventually leave the water and sit, full up to their necks, on any convenient bough or rock, their wings distended and plumage ruffled as they bask in the sun. When breeding the birds have sometimes to wander considerable distances to obtain food for their voracious young. In these cases they may be seen, morning and evening, flying to and from their fishing in long horizontal lines of birds, their wings flapping steadily and quickly and making fair progress. On land they progress with difficulty but are capable of little spurts, running upright, just as Mergansers do, much in the manner of Penguins. Their note is a harsh croak and they have many unpleasant guttural conversational notes as well.

(2181) Phalacrocorax fuscicollis.

THE INDIAN SHAG.

Phalacrocorax fuscicollis Steph., in Shaw's Gen. Zool., xiii, p. 91 (1825) (India); Blanf. & Oates, iv, p. 341.

Vernacular names. Same as the preceding, often with a prefix meaning small.

Description.—Breeding plumage. Feathers of the mantle and wings dark bronze-brown, each feather edged with black; a border to the pouch, a tuft behind the eye and speckles on the side of head and neck pure white; remainder of plumage black glossed with deep blue-green.

Colours of soft parts. Iris green or blue-green; bill dark brown; base of lower mandible reddish-horny; gular skin yellow; naked skin of face black-purplish in the breeding-season yellowish at other times; legs and feet black.

Measurements. Wing 257 to 276 mm.; tail 132 to 144 mm.; tarsus about 47 to 52 mm.; culmen 50 to 61 mm.; generally 54 to 58 mm.

Young birds have the upper parts brown, the mantle more bronze and with black edges; tail and primaries dark brown; chin and throat white; fore-neck brown with white streaks; breast and abdomen white; flanks mottled brown and white.

Nestling in down sooty-black.

Distribution. All India, from Ceylon to the North Central Provinces and Bombay; Cutch and Sind; South United Provinces as far North as Delhi; Western India to Orissa, Bengal and Assam; all Burma, Manipur, Cachar and Sylhet.

Nidification. The Indian Shag breeds generally in July, August and September, very often in company with Herons, Egrets and other birds. The nest is always placed on trees, very often those standing in water but which in the dry season stand clear of the water on banks and higher land. In Madras and again in Gujerat and Sind this Cormorant sometimes breeds during the Cold Weather and Bulkly found them making their nests in the same trees as those occupied by the Large Cormorant. The nests and eggs are small replicas of those of the preceding bird and the latter number three to five. One hundred average 51·3 x 33·2 mm.: maxima **55·8 x 35·6** mm.; minima **46·3 x 31·8** mm.

Habits. Quite typical of the genus, though this bird is never found either breeding or fishing in such large colonies and flocks as the Large Cormorant. On the Mekran and South coasts all three species of Cormorant may be seen fishing in the sea and both the Large Cormorant and Shag breed in the mangrove swamps on the mangrove trees in company with Herons of various kinds.

(2182) Phalacrocorax niger.

THE LITTLE CORMORANT.

Hydrocorax niger Vieill., Nouv. Dict. d'Hist. Nat., viii, p. 88 (1817).
Phalacrocorax javanicus. Blanf. & Oates, iv, p. 342.

Vernacular names. *Pan-kowa*, *Jog-rabi* (Hind.); *Pan-kowri*, *Pan-kouti* (Beng.); *Niru-kahi* (Tel.); *Kadal Kagam*, *Nir-kakam* (Tam., Ceylon); *Diya Kawa* (Cing.); *Di-dao-kwa-kashiba* (Cachari).

Description.—Breeding plumage. General colour black with a deep blue or blue-green gloss; scapulars, inner secondaries, wing-coverts, except the least, dark silvery-grey with black edges; a few white silky feathers on the fore-crown and sides of the head and neck. There is a slight crest on the occiput and nape.

Colours of the soft parts. Iris green; bill horny-brown, blackish at the tip and livid purple at the base; gular skin and orbital skin black in the non-breeding-season, purple in the breeding-season; legs and feet blackish, tinged with purple flesh-colour when breeding.

Measurements. Wing 181 to 205 (once 212) mm.; tail 133 to 146 mm.; tarsus 35 to 40 mm.; culmen 29 to 34 mm.

In Winter the white filaments disappear on the head and neck but the feathers at the base of the lower bill are white, these sometimes extending to the throat.

Young birds are brown with the feathers of the back edged paler; the scapulars and inner secondaries are grey edged whitish and with broad black sub-edges; throat white; centre of abdomen white and feathers of flanks and breast fringed with brownish-white.

Distribution. Ceylon, India, Burma, Malay Peninsula to Sumatra, Java and Borneo.

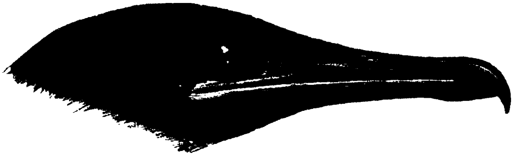


Fig. 46.—Head of *P. niger*. ½.

Nidification. The Little Cormorant breeds all over the Empire where there are suitable lakes and marshes or even small ponds. Over most of India they lay after the rains have well broken, from July to September. In Ceylon they lay in March and April and again in November to December. Most of the colonies are small, half a dozen pairs, but a few number as many as fifty or sixty. The eggs only differ from those of the other Cormorants in their very small size and, perhaps, in being rather more narrow and pointed in proportion. One hundred eggs average 44·8 × 29·0 mm.: maxima **48·1** × 28·4 and 45·1 × **31·0** mm.; minima **41·1** and 28·7 × 41·8 × **26·3** mm.

Habits. In the non-breeding-season the Little Cormorant may be found on rivers, swamps and even village ponds, for it is a most familiar and fearless little bird. Even at this season they roost in company and sometimes, like their larger relatives, hunt and fish together. The call, flight etc. are like that of the other Cormorants.

Subfamily ANHINGINÆ.

Genus ANHINGA.

Anhinga Brisson, Ornith., i, p. 60, vi, p. 476 (1760).

Type by taut., *Plotus anhinga* Linn.

In this genus the bill is slender, straight, very sharp-pointed, with both margins of the commissure toothed near the tip; no lateral groove, the nostrils are small, basal and linear; neck very slender, with a bend at the 8th and 9th vertebræ which enables the bird, by suddenly straightening its neck, to transfix its fishy prey. The wings are pointed, third quill longest; scapulars elongate and lanceolate; tail of twelve long, rigid feathers and cuneate in shape.

(2183) Anhinga melanogaster.

THE INDIAN DARTER OR SNAKE-BIRD.

Anhinga melanogaster Pennant, Ind. Zool., p. 13 (1769) (India).
Plotus melanogaster. Blanf. & Oates, iv, p. 344.

Vernacular names. *Panwa*, *Pan dubbi* (Hind.); *Sili* (Sind); *Goyar* (Beng.); *Kallaki-Pitta* (Tel.); *Chakuri* (Southern Gonds); *Pambuttara* (Tam., Ceylon); *Diya Kawa*, *Belli Kawa* (Cing.); *Maniori*, *Begiagir* (Assam).

Description. A white streak from the eye extending some way down the sides of the neck; chin and throat white speckled with brown; remainder of head and neck brown, each feather finely edged paler; upper back blackish-brown, merging into the brown neck, the feathers with pale edges; lower back, rump, upper tail-coverts, tail and lower plumage black, glossed above, more dull below; scapulars, wing-coverts and inner secondaries black with long silver-grey centres to each feather; primaries and outer secondaries black; the innermost secondary and the central tail-feathers are corrugated.

Colours of soft parts. Iris white on an inner wing, yellow on an outer; bill dark horny-brown, the terminal half black and the lower mandible yellowish; legs and feet black.

Measurements. Wing 331 to 357 mm.; tail 202 to 240 mm.; tarsus about 42 to 47 mm.; culmen 74 to 90 mm.

Young birds have the head and neck paler brown, the white streak hardly showing; lower back to upper tail-coverts dark brown; feathers of mantle narrowly edged with rufous and the silver streaks duller and tinged with rufous; under-plumage brown; tail tipped with whity-brown.

Nestling in down pure white but when first hatched naked and black.

Distribution. All India, Burma and the Indo-Chinese countries; the Malay Peninsula to the Celebes and Philippines and West to Mesopotamia.

Nidification. The Snake-bird breeds in Ceylon from January to March on the big inland tanks; in South India most birds lay in the same month but in Sind and all Northern India, Assam and Burma they lay during the late Rains from July to September. In the Calcutta Zoological Gardens they breed in the latter half of June, possibly due to the large fish-supply in the lake inducing them to start early. They often associate in very large colonies for nesting purposes; some colonies number several hundred but, on the other hand, many only number a dozen or less. The nests are well made, rather larger than those of the Little Cormorant, with which they so often breed, and are placed in trees, generally smallish ones standing in water. The eggs number three or four, more often the former, and are like those of the Cormorants. Sixty average 53·0 × 35·5 mm.: maxima **54·8** × 36·1 and 54·2 × **37·0** mm.: minima **50·7** × 33·**6** mm.

Habits. The Darter closely resembles the Cormorants in its habits but is entirely a freshwater bird and will not be found on sea-coasts. As an expert fisher it surpasses even these birds, swimming at almost incredible pace under water after fish, which it kills by a rapid thrust with its pointed bill. After impaling them it rises to the surface, throws them into the air and catches them as they descend. It is said sometimes to catch them between its mandibles when hunting but I have never seen them do this. Its flight is like that of the Cormorant and its voice similar but much lower. In swimming, although it can and often does rest lightly on the water, it more often is seen with only the head and neck exposed. It has the usual habit of sitting on a stake or branch with its wings "spread out to dry" in the sun.

Family SULIDÆ.

The Gannets or Boobies are black and white, or brown and white, birds of considerable size, inhabiting the open sea and living upon fish. They have a powerful pointed bill and the outer nostrils are completely closed in adults. There are 18 cervical vertebræ; the ambiens, femoro-caudal and semi-tendinosus muscles are present, the two accessory thigh-muscles absent; there are no syringeal muscles.

Some recent authors, Mathews especially, has divided the *Sulidæ* into many genera, nearly every genus containing but one species. Mathews relies on certain characters such as the reticulation or scutellation of the tarsus and toes which, admittedly, differs in nearly every species but the very fact that it differs so constantly seems to prove that it is not of generic value. I prefer to retain all our Indian species in the one genus, *Sula*.

Genus **SULA.**

Sula Brisson, Ornith., i, p. 60, vi, p. 494 (1760).

Type by first desig., *Sula leucogaster* Linn.

In this genus the bill is powerful, straight, compressed and pointed; the culmen is flattened, broad at the base, curved at the end but not hooked; the upper mandible has a groove on each side near the culmen; the nostril is completely closed in adults, minute and basal in young birds; the inner margins of both mandibles are serrated, more strongly so towards the tip; the wings are long and pointed; the tail long and wedge-shaped; the tarsus is short but powerful, with the outer and middle toes equal and the claw of the middle toe broad and pectinated.

The Boobies and Gannets inhabit the tropical and temperate seas but are only very casual visitors to the shores of India, three species having been known to occur, one of which, *dactylatra*, has been represented by two subspecies, one an Eastern, the other a Western form.

Key to Species.

A. Tail-feathers fourteen.
  a. Head, neck and upper parts brown in adults; feet pale yellow .... *S. leucogaster*, p. 285.
  b. Head, neck, body and tail white in adults; feet red .... *S. sula*, p. 286.
B. Tail-feathers sixteen; head, neck and body white in adults; tail blackish; feet slaty. *S. dactylatra*, p. 287.

Sula leucogaster.

Pelecanus leucogaster Bodd., Pl. Enlum., p. 57 (1783).

Type-locality: Cayenne, South America.

The typical form is rather larger and darker than the race which has once visited our limits.

(2184) Sula leucogaster plotus.

THE BROWN GANNET.

Pelecanus plotus Forster, Descript. An., p. 278 (1844) (New Caledonia).
Sula leucogaster. Blanf. & Oates, iv, p. 346.

Vernacular names. None recorded.

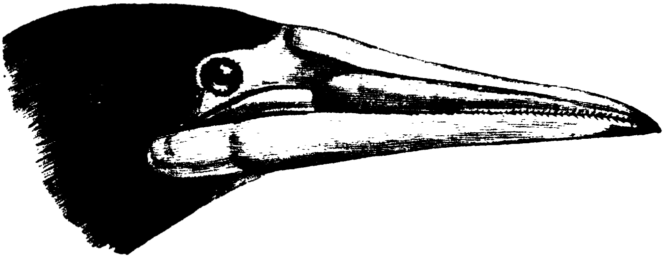


Fig. 47.—Head of *S. l. plotus*. ½.

Description. Whole head and neck, upper plumage, wings and tail chocolate-brown; median under wing-coverts white, others brown; lower plumage and axillaries pure white.

Colours of soft parts. Iris silver-grey; bill and orbital skin yellow; legs and feet pale yellow. Tail-feathers sixteen to eighteen.

Measurements. Wing 386 to 414 mm.; tail 188 to 197 mm.; tarsus about 45 to 50 mm.; culmen 93 to 101 mm.

Young birds have the upper parts, head and neck much paler brown; the white on the lower parts is replaced by pale smoky-brown, most of the feathers white-edged.

Nestling in down pure white.

Distribution. North-East and North-West Australia through the Austro-Malayan islands to Malacca, once to the Laccadives.

Nidification. Macgillivray found this Booby breeding on an island off New Holland and describes the nests as ill-made heaps of herbage with hardly any cavity and, generally, containing two eggs. On the Great Barrier reefs other colonies were observed. Many birds bred in immature plumage, as do all the Gannets.

This species is said not to attempt to defend young or eggs when molested but to move off quickly with merely a protesting croak or two.

The few eggs I have seen of this subspecies are very much like those of Cormorants in texture etc. but broader in proportion; the real colour is a pale blue but this is overlaid with a thick covering of calcium, white when fresh but soon discoloured and dirty. Seven eggs average 59·7 × 40·4 mm.: maxima **64·0** × 40·1 and 60·0 × **42·3** mm.; minima **56·0** × 41·7 and 59·3 × **26·6** mm.

Habits. The Booby frequents small islands and rocky sea-coasts in large colonies, living on fish, cuttlefish etc. The fish it usually takes by diving when swimming but sometimes by diving into the sea from some height as it flies along. Its flight is very strong and consists of alternate flappings and sailings with stiff outspread wings. In many places it is said to be extremely fearless, having to be forced off its eggs or young, whilst on Darnly Island it is said to be commonly tamed, the birds fishing for their own food and then returning to the huts of their respective native owners. Its call is a loud, harsh croak. Its occurrence in India is casual only but it has been obtained in Ceylon and has been frequently seen off the coasts of Eastern India and Burma.

Sula sula.

Pelecanus sula Linn., Syst. Nat., 12th ed., i, p. 218 (1766).

Type-locality: Ascension Isl., Atlantic Ocean.

This is a larger bird than *S. s. rubripes*, not quite so dark and with dark legs.

(2185) Sula sula rubripes.

THE AUSTRALIAN RED-LEGGED GANNET.

Sula rubripes Gould, Syn. B. of Aus., pt. iv, App. p. 7 (1838) (Raine Island, Queensland).
Sula piscatrix. Blanf. & Oates, iv, p. 347.

Vernacular names. None recorded.

Description. Primaries, secondaries and greater wing-coverts blackish-brown, the visible portion washed with silver-grey; remaining plumage white, often washed or stained with fulvous.

Colours of soft parts. Iris grey; bill red, paler and more flesh-coloured in the young; bare skin of face pale purplish, red in the breeding-season; pouch pink flesh-colour; legs and feet red. Tail-feathers fourteen.

Measurements. Wing 403 to 421 mm.; tail 219 to 228 mm.; tarsus about 40 to 43 mm.; culmen 90 to 97, once 88 mm.

Young birds have the head, neck and underparts silvery yellowish-brown, the underparts more grey and darker towards the vent; rest of plumage dark brown.

Nestling in down pure white.

Distribution. Queensland in Australia, the Austro-Malayan islands to the coast of Indo-China, the Malay Peninsula and the Bay of Bengal. Hume also identified a flock of Gannets seen by him on the Laccadives as being of this species. The only Indian specimen in the British Museum collection was obtained in "The Bay of Bengal."

Nidification. The Red-legged Gannet breeds on rocks and islands in colonies, often of great size, laying one or two white, rather chalky-surfaced eggs. The nest varies from one composed of a few sticks or a mass of weeds and grass to a big substantial platform of sticks, placed on low shrubby growth a foot or so from the ground.

The birds sit very close and when the eggs are advanced in incubation, or there are young in the nests, the parents have to be ejected from them by force.

Habits. Those of the genus.

Sula dactylatra.

Sula dactylatra Lesson, Traité d'Orn., p. 661 (1831).

Type-locality: Ascension Island.

The typical form has a more slender bill than either of those which have visited India; it also has yellow legs and feet.

Key to Subspecies.

A. Bill smaller and more slender; legs and feet dark slaty-blue to black	*S. d. melanops*, p. 287.
B. Bill longer and more stout; legs and feet greenish-blue, not so dark	*S. d. personata*, p. 288.

(2186) Sula dactylatra melanops.

THE RED SEA MASKED BOOBY OR GANNET.

Sula melanops Heugl., Isis, 1859, p. 351, pl. x, fig. 2 (Red Sea).
Sula cyanops. Blanf. & Oates, iv, p. 347.

Vernacular names. None recorded.

Description. Tail, primaries, secondaries, longest scapulars and greater wing-coverts dark chocolate-brown; remainder of plumage white.

Colours of soft parts. Iris yellow, reddish or greenish-yellow: bill greenish-yellow; naked skin of face dark bluish-slate colour; legs and feet dark slaty-blue to black. Tail-feathers fourteen.

Measurements. Wing 414 to 430 mm.; tail 168 to 182 mm.; tarsus about 52 to 58 mm.; culmen 95 to 106 mm., generally under 102 mm.

Young in first plumage. Brown all over, darker and browner above, paler and more grey below.

Young in second plumage. Whole head and neck chocolate-brown; back, rump, upper tail-coverts and wing-coverts brown with white edges to each feather.

Between this stage and the adult every form is to be met with, the final before the complete white plumage is attained, showing only a few brown spots on the scapulars, lesser wing-coverts, rump and upper tail-coverts.

Nestling in down. Pure white.

Distribution. Red Sea and Persian Gulf as far South down the East African coast as Madagascar and on the Indian coast occurring casually from the Mekran coast to the Laccadives. It was obtained by Murray at Karachi and by Sinclair in the Bombay Harbour.

Nidification. Ticehurst thinks this species may breed on the Haski, one of the islands off the Oman coast but, so far, its breeding-haunts have not been discovered.

Habits. This is a not uncommon bird but keeps so entirely to the sea that, though it must constantly occur along the North-west coast, it is but seldom seen. Murray obtained one from fishermen which was said to have been killed off the Karachi coast. Butler saw two or three off the Sind Coast and it was observed by Sinclair close to Bombay and by Ticehurst off the Mekran coast at Omara.

In all respects its habits are those of the genus but it seems nowhere to associate in very large flocks, though it may do so in its breeding-haunts.

(2187) Sula dactylatra personata.

THE AUSTRALIAN MASKED BOOBY OR GANNET.

Sula personata Gould, P. Z. S., 1846, p. 21 (Raine Island).
Sula cyanops. Blanf. & Oates, iv, p. 347.

Vernacular names. None recorded.

Description. Differs from the preceding form in its bigger, coarser yellow bill and in having paler, greenish-blue legs.

Colours of soft parts. Bill yellow, never greenish; legs and feet greenish-blue.

Measurements. Culmen 103 to 114 mm.; wing 419 to 452 mm., nearly always over 430 mm.

Distribution. Australia, through the Austro-Malayan islands to the coasts of Indo-China and thence as a straggler to the Bay of Bengal.

Nidification. Macgillivray records the breeding of this Gannet in Raine Island on the 15th of July, on which date, however, there was but one egg laid. In the 'Emu' he describes the nests as similar to those of other Boobies and invariably built on the ground. The eggs are two in number and not distinguishable from those of other Boobies except by their size. When disturbed the birds shuffle off their nests and run a few paces, disgorging fish, before they rise on the wing.

Habits. Those of the genus.

Family PHAËTHONIDÆ.

This family contains the Tropic-birds, similar in general appearance to large Terns but in structure closely allied to the Gannets, Cormorants and Frigate-birds. The plumage is principally black and white in the adults.

The bill is rather short, pointed, with no hook and with small narrow nostrils which are pervious; the palate is desmognathous, the maxillo-palatines being separate behind, though united with the nasal septum anteriorly, whilst the vomer is well developed and conspicuous; the cervical vertebræ number fifteen; the femoro-caudal, semi-tendinosus and accessory semi-tendinosus are present, the last-named muscle not occurring in any other of the Steganopodous birds; the ambiens is absent; syringeal muscles are present.

The members of this family lay eggs which are extraordinarily like those of the Raptores, especially the genus *Neophron* of the *Ægypiidæ*.

A great many genera have been created for this family but I retain all our Indian species in the one genus, *Phaëthon*.

Genus **PHAËTHON**.

Phaëthon Linn., Syst. Nat., 10th ed., i, p. 134 (1758).

Type by orig. desig., *Phaëthon æthorius* Linn.

In this genus the bill is short, stout, with the culmen curved throughout and the margins finely serrated: the wings are very long and pointed with the first primary longest; the middle rectrices are excessively elongated and attenuated, looking like streamers in flight; the tarsus is short and fairly stout.

Three species have been recorded as occurring within the limits of this work and the genus is represented throughout the tropical seas of the world.

These birds are known among sailors as the Bo'sun Birds.

Key to Species.

A. Elongated central rectrices white.
  a. Back barred in adults; white tips to primaries very narrow; tail-feathers 14 .... *P. indicus*, p. 291.
  b. Back white in adults; white tips to first primary over 12 mm.; tail-feathers 12. *P. lepturus*, p. 293.
B. Elongated central rectrices deep red .... *P. rubricauda*, p. 292.

(2188) Phaëthon indicus.

THE SHORT-TAILED TROPIC-BIRD.

Phaëton indicus Hume, Str. Feath., iv, p. 481 (1876) (Mekran).
Phaëthon indicus. Blanf. & Oates, iv, p. 349.

Vernacular names. None recorded.

Description. A black patch round the front of the eye and extending back over it as a supercilium to the nape; nape, hindneck, back to upper tail-coverts narrowly barred with black; primaries black with broad white inner webs; outer secondaries white with black shafts, the inner almost all black; least coverts next the body pure white, those next them black with narrow white fringes, greater and median pure white; axillaries black with broad white edges; remainder of plumage white.

Colours of soft parts. Iris dark brown; bill orange-red to dusky red, the tip, edge of commissure and nareal groove blackish; legs and feet yellow or yellowish-white, the anterior toes and webs between them black.

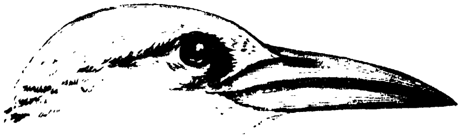


Fig. 48.—Head of *P. indicus.* ½.

Measurements. Wing 281 to 301 mm.; tail 215 to 301 mm.; tarsus 25 to 28 mm.; culmen 55 to 60 mm.

Young birds are like the adult but sometimes have black spots on the crown.

"**Young in first plumage** like the adult but with black tips to the central tail-feathers." (*Ticehurst*).

Nestling in down greyish-white, rather darker on the occiput.

Distribution. Northern Indian Ocean to the Persian Gulf.

Nidification. This beautiful Tropic-bird breeds during April and the end of March on the islands of the Persian Gulf, laying a single egg on the bare rock with no nest but under the shelter of a ledge or in a crevice. In 1898 Irvine took an egg of a Tropic-bird, but did not obtain the parent and this he put down as *Phaëthon rubricauda*, which, of course, it could not have been. Then in 1916 Pitman obtained an egg found in a wide crevice in a rock on a barren island in the Persian Gulf. This was supposed to be an egg casually laid by a passing Kite but is certainly an egg of this species. Finally Sir Percy Cox received two genuine eggs through La Personne taken on Nabi-u-tand Island at the head of the Gulf. This island, too, is a very barren, rocky spot and the eggs were both taken from ledges protected by overhanging rock. These three eggs vary greatly in colour. One is white, faintly smeared with pale reddish in a ring round the larger end, with a few scattered specks and small blotches elsewhere; the second is white, richly blotched with blood-red-brown at the larger end and very sparsely elsewhere; the third is freckled all over with dark dull reddish-brown, the freckles coalescing to form a cap at the larger end. The three eggs measure 54·5 × 41·3, 58·1 × 42·3 and 64·0 × 48·1 mm. In shape all are broad blunt ovals, whilst the texture is hard but coarse and rather rough. The inner membrane is white with a faint yellow tinge.

Habits. Tropic-birds, except at their breeding-places, are seldom seen close to land, spending their whole time at sea and nearly all on the wing, though they can and do swim well and easily like a Gull. Sailors call them Bos'un Birds and they will follow ships for many miles and when tired will sometimes rest on masts. Their flight is exceptionally easy and elegant and as they turn from side to side, their long tail stretched behind them, they form a very beautiful picture. Their only note seems to be a low, harsh croak. Their food consists of mollusca, fish and other sea-surface life. They do not dive for their food but, if this is very small, take it up in the bill or, if fish, seize it with the bill but, when scavenging behind a ship, they catch scraps with their feet like Gulls.

(2189) Phaëthon rubricauda rubricauda.

The Red-tailed Tropic-bird.

Phaëthon rubricauda Bodd., Tabl. Pl. Enl., p. 57 (1783) (Mauritius) Blanf. & Oates, iv, p. 250.

Vernacular names. None recorded.

Description. A patch from the gape up to the eye, narrowly over it and in a broader streak behind black; primaries black-shafted; inner secondaries with broad black centres and black shafts; long attenuated portions of the central tail-feathers bright red with black shafts; remainder of plumage white, more or less tinged with rosy.

Colours of soft parts. Iris brown; bill yellow or reddish-yellow to orange-red; legs yellow, toes and webs black.

Measurements. Wing 330 to 339 mm.; tail 360 to 428 mm.; tarsus 30 to 33 mm.; culmen 66 to 69 mm.

Young birds are white, the upper parts barred with black; primaries white with broad black shaft-streaks; outer secondaries white with black shafts, inner nearly all black; tail-feathers pure white with black shafts and black subapical spots, the central feathers also tipped with black.

Nestling in down pure white.

Distribution. Red Sea and Persian Gulf to Mauritius and Assumption Islands.

Nidification. Nothing recorded. Various other subspecies breed in vast numbers on some of the islands in the Austro-Malayan region, laying their eggs on shelves of rocks or cliffs or in crevices of the rocks. Two eggs of this species in my collection taken on an island near Mauritius measure 64·6 x 49·3 and 70·8 x 49·3 mm. respectively. One of them is deep brick-red throughout, the red speckling completely obliterating the ground-colour. The second egg has the ground-colour just visible, showing it to be a yellow-stone; the whole surface is covered with tiny freckles of red and with secondary freckles of lilac, whilst there are also a few reddish-brown blotches and spots, mostly at the larger end. They were taken, slightly incubated, on the 16th of January.

Habits. Similar to those of the preceding species.

(2190) Phaëthon lepturus lepturus.

THE WHITE TROPIC-BIRD.

Phaethon lepturus Daudin, Buff. Hist. Nat., xiv, p. 319 (1802) (Mauritius).
Phaëthon flavirostris. Blanf. & Oates, iv, p. 350.

Vernacular names. None recorded.

Description. Very similar to *L. indicies* but with the back pure unbarred white and having a much longer tail; the primaries are black with white tips and broad white inner webs, the white increasing until the seventh is all white; outermost secondaries pure white; innermost secondaries and scapulars black with broad white edges; inner least wing-coverts white, those next them black and the median and greater pure white; tail-feathers black-shafted.

Colours of soft parts. Iris brown; bill pale yellow; tarsi yellow, feet black.

Measurements. Wing 252 to 282 mm.; the central tail-feathers up to 575, generally about 450 mm.; tarsus 21 to 23 mm.; culmen 44 to 51 mm.

Young birds have the head, neck, upper parts and lesser wing-coverts barred with black, otherwise all white except the black eye-patch.

Nestling in down pure white.

Distribution. Red Sea and Persian Gulf, over the whole of the Indian Ocean. Breeding in Rodriguez and Mauritius.

Nidification. Similar to that of other species of Tropic-birds. Three eggs in my collection vary considerably. One is like an egg of *Pernis*, deep red with still deeper blotches; the second is similar but duller and with the blotching confined to the larger end; the third gives one the impression of a lilac-grey egg, the ground-colour dull pinkish, covered with freckles of grey-lavender and reddish and with a few scattered blotches of dark red here and there over the whole surface and in a deep ring round the larger end. They measure 56·4 x 39·1, 59·0 x 40·3 and 53·1 x 41·0 mm. The breeding-season is May, June and July, varying somewhat in different islands.

Habits. Those of the genus.

Family FREGATIDÆ.

This family contains the Frigate-birds, formerly contained in the single genus *Fregata* but now sometimes divided, perhaps without need, into several genera by some systematists. For the purpose of this work I retain the three species dealt with in one and the same genus. The Frigate-birds are rather large dark-coloured oceanic birds, which far surpass all other Steganopodes in length of wing and which greatly resemble the Raptores in their manner of flight.

All four toes are united by a web, but this is much less developed than in the other families; the tarsus is broad and very short; the furcula is anchylosed to the keel of the sternum; cervical vertebræ fifteen; ambiens and femoro-caudal muscles present, the other characteristic thigh-muscles wanting; syringeal muscles present.

Genus FREGATA.

Fregata Lacépède, Tabl. Oiseaux, p. 15 (1799).

Type by mon., *Pelecanus minor* Gmelin.

In this genus the bill is long, the culmen convex in the centre, strongly hooked at the tip, both mandibles being curved downwards; the culmen is flattened, with deep lateral grooves bifurcating at the dertrum, the lower branch terminating in a notch at the margin; nostrils, small, linear and impervious, are placed in the groove near the base; the gular pouch is greatly developed; wings very long and pointed, first quill much the longest; tail of twelve feathers, long and deeply forked; tarsus very short and feathered: middle toe longest; claws long, much curved and that of the middle toe pectinated inside.

Key to Species.

A. Anterior abdomen and flanks white in adults.	*F. andrewsi*, p. 295.
B. Whole abdomen black or blackish in adults.	*F. minor*, p. 297.
C. A patch of white on each side of the anterior abdomen in adults.	*F. ariel*, p. 297.

(2191) Fregata andrewsi.

THE CHRISTMAS ISLAND FRIGATE-BIRD.

Fregata andrewsi Mathews, Austral Av. Record, ii, p. 110 (1914) Christmas Is.).
Fregata ariel. Blanf. & Oates, iv, p. 338.

Vernacular names. None recorded.

Description.—Male. Whole plumage black, the feathers of the head, back and mantle very long, lanceolate and strongly glossed with metallic green; anterior abdomen and flanks white; lesser wing-coverts edged with pale brown.

Colours of soft parts. Iris red; bill bluish-grey; gular skin, legs and feet red.

Measurements. ♂: culmen 127 to 130 mm.; wing 600 to 625 mm.; tail 375 to 400 mm.; middle toe 54 to 60 mm.; ♀: culmen 137 to 145 mm.; wing 635 to 643 mm.; tail 430 to 450 mm.; middle toe 60 mm.

Female differs from the male only in having the breast, abdomen and flanks pure white. Judging from the sexed specimens in the British Museum the wings of males and females have the measurements alike.

Young birds have the upper parts blackish, the centre of the back duller brown; the feathers are short and rounded and have no gloss; the whole head, neck and breast are white, much suffused with rufous; there is a broad band of brown below the breast; abdomen white; vent, thigh-coverts and under tail-coverts black.

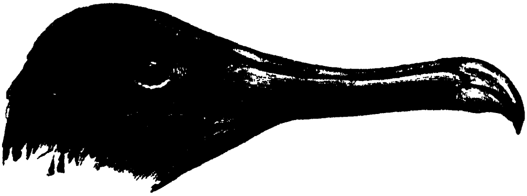


Fig. 49.—Head of *F. andrewsi*. ½.

Distribution. Indian Ocean; breeding on Christmas Island, whilst immature specimens have been obtained on Assamba Island and Cocos Keeling Island.

Nidification. The Christmas Island Frigate-bird breeds in large colonies, making a rough nest of sticks and weeds, which it places either actually on the ground, or within a few inches of it in the scrubby growth on the shores above high-water mark. The eggs number one or two and are all pure white, in shape like those of the Gannet but without any chalky covering and decidedly more fragile. They measure about 70·4 × 50·4 mm. but a larger series than mine would probably give much smaller measurements.

The breeding-season seems to be April.

The birds sit very close and snap at anyone disturbing them but do not eject fluid in the unpleasant way the Petrels do.

Habits. Frigate-birds in their manner of feeding resemble the

Skuas, bullying Gulls and Terns and making them give up freshly-caught fish and disgorge those they have swallowed, catching the rejected article before it has time to fall into the sea. At other times they evidently feed themselves, as their stomachs have been found to contain the remains of crabs, crustacea of other kinds and certain food on which their victims do not normally feed. Their power of flight is wonderful and it is but seldom they are seen to rest on land or sea, though, of course, they are fine swimmers when necessary. Their ordinary call is a loud, fierce croak.

Fregata minor.

Pelicanus minor Gmelin, Syst. Nat. i, (2) p. 572 (1789) (Jamaica).

The typical form is larger than *F. m. aldabrensis.*

(2192) Fregata minor aldabrensis.

THE WESTERN LESSER FRIGATE-BIRD.

Fregata minor aldabrensis Mathews, Austral Av. Record, ii, p. 119 (1914) (Aldabra).
Fregata aquila. Blanf. & Oates, iv, p. 338.

Vernacular names. None recorded.

Description.—**Male.** All black; the feathers above glossed with green; lesser wing-coverts brown; lower plumage dark brown rather than black.

Colours of soft parts. Iris brown; bill, ♂ lead-colour, ♀ dirty light blue; legs and feet, ♂ black, ♀ bright red. In some female skins the bill is noted as "rose." The pouch is dull brick-red.

Measurements. Wing, ♂ 585 to 603 mm., ♀ 605 to 621 mm.; tail, ♂ 392 to 410 mm., ♀ 395 to 430 mm.; middle toe 48 to 57 mm.; culmen, ♂ 116 to 130 mm., ♀ 130 to 150 mm.

Female. Differs from the male in having the gloss on the upper plumage less developed and the fore-neck and breast white; the chin and throat are mottled brown and white.

Nestling in down white with a rusty stain.

Distribution. Aldabra, Seychelles, Glorioso. A female was obtained by Nicoll in Ceylon.

Nidification. This Frigate-bird is said to lay one or two eggs in nests similar to those described of the other species, but I can find no full description of its breeding.

Habits. Those of the genus.

Fregata ariel.

Atagen ariel Gray, Gen. Birds, iii, p. 669, pl. 183 (1845). (Raine Island, N. Queensland).

(2193) Fregata ariel iredalei.

IREDALE'S FRIGATE-BIRD.

Fregata ariel iredalei Mathews, Austral Av. Record, ii, p. 121 (1914) (Aldabra).

Vernacular names. None recorded.

Description.—Male. Whole plumage black; the upper parts glossed with blue-green and the feathers of the mantle lanceolate; the lower plumage is a duller black, the feathers lanceolate and slightly glossed like those of the back with a white spot on both sides of the abdomen.

Colours of soft parts. Iris, bill and feet black in the male, red in the female; gular pouch and eyelids red.

Measurements. Wing, ♂ about 520 to 530 mm., ♀ 530 to 545 mm.; culmen, ♂ 93 to 99 mm., ♀ 100 to 102 mm.

Female. Much duller than the male, more brown, less black above and much less glossy; breast and a broad nuchal collar white suffused with rusty-red; lesser wing-coverts brown.

Young birds have the whole head and upper breast white suffused with rusty; a broad band across the lower breast; abdomen white.

Nestling in down white.

Distribution. Aldabra, Seychelles, Mascarenes, Madagascar, Keeling Is., Somali coast, Ceylon.

Nidification. There is very little on record about the breeding of the Frigate-bird but Wood-Jones found it breeding on Cocos Keeling Island. An egg in my collection taken by him measures 60·1 × 43·1 mm. and was taken on the 10th of June.

Habits. Those of the genus.

Order XI. TUBINARES.

The Petrels seem to form a natural link between the Gulls and the Steganopodes, having a very strong external resemblance to the former, yet a closer structural affinity to the latter. They may be at once distinguished from all other birds by the impervious nostrils, which terminate externally in tubes, separate or united; the rhamphotheca, or horny covering of the bill, is divided into several sections by deep grooves, as in some Steganopodes, whilst the upper mandible is generally much hooked at the end; the anterior toes are webbed throughout; the hallux is either small, rudimentary or wanting, being frequently represented by the claw-phalanx alone; the wings are long; there are eleven primaries and the fifth secondary is absent; the oil-gland is present and tufted; the spinal feather-tract is well developed on the neck with lateral apteria and is forked on the back.

Petrels are schizognathous and holorhinal; the vomer is large, broad, depressed and pointed; cervical vertebræ fifteen; there are large supraorbital glands; there are two carotids; the cæca are rudimentary or wanting; the femoro-caudal and semi-tendinosus muscles are always present, the ambiens and accessory femoro-caudal generally present, only absent in a few species.

The classification of the Petrels has been a much-debated question and was commented on by Blanford in the first edition of this work. Here it is perhaps unnecessary to comment at any length, beyond saying that further investigation will probably support those systematists who separate the Puffins (*Puffinidæ*), which possess basipterygoid processes, from the *Procellariidæ*, which have none.

So far as convenience goes and on account of the small number of genera and species occurring in India, it seems best to follow Blanford and retain them all in the one family *Procellariidæ*. The Albatrosses do not come within the purview of this work and it is therefore needless to discuss their position.

Family PROCELLARIIDÆ.

Characters those of the Order.
Four genera are represented within our area.

Key to Genera.

A. Tarsus much longer than middle toe; wing not exceeding 200 mm.; nostrils with a single anterior orifice.
  - *a.* Basal phalanx not half length of mid-toe .. **Oceanites**, p. 300.
  - *b.* Basal phalanx more than half length of mid-toe .... **Fregetta**, p. 302.

B. Tarsus shorter than mid-toe; wing exceeding 200 mm.
  - *c.* Nostrils separated at the orifice by a broad septum .... **Puffinus**, p. 303.
  - *d.* Nostrils not separate at the orifice, but divided inside .... **Daption**, p. 307.

Genus OCEANITES.

In this genus the bill is slight and weak, shorter than the head; the nostrils combine in a single external orifice; the wings are very long, with the second primary longest; the tail is moderate and very shallowly forked; the tarsi are smooth and much longer than the toes; the tibia is partly naked and the hind toe is only represented by a tiny claw; the basal phalanx of the middle toe is not flattened and is shorter than the other phalanges and claw together, the claws are sharp, spatulate but little flattened. The genus breeds in the extreme South of the Southern Oceans and wanders into the North and South Temperate Zones.

(2194) Oceanites oceanicus oceanicus.

WILSON'S STORMY PETREL.

Procellaria oceanica Kuhl., Beitr. Anat., ii, p. 136, pl. x (1820) (South Atlantic Ocean); Blanf. & Oates, iv, p. 354.

Vernacular names. None recorded.

Description. Upper tail-coverts, bases of outer tail-feathers and sides of flanks from vent pure white, greater secondary coverts grey with white tips; remainder of plumage sooty-brown; the primaries almost black with paler inner webs.

Colours of soft parts. Iris dark brown to black; bill, legs and feet black, the centre of the webs yellowish.

Measurements. Wing 140 to 157 mm.; tail 72 to 84 mm. tarsus about 32 to 36 mm.; culmen 12 to 14 mm.

Distribution. South Atlantic and Indian Oceans. Cumming obtained two specimens at Omara in the Persian Gulf and Butler obtained a third off the Mekran coast.

Nidification. This little Petrel breeds in great numbers on Laurie Island and other islands in the South Orkneys as well as in some of the more Southern islands. No nest is made, the single egg being deposited in a hollow under a rock, in narrow clefts and crevices in the face of a cliff and sometimes under stones, forming part of the débris at the foot of the cliffs. Often they are placed so far inside the crevices that it is impossible to get them out; at other times the face of the cliff is so crumbling and dangerous that it cannot be climbed, with the result that, though numerous nests may be found, very few eggs are taken. The birds sit very close and have to be hauled out of the nesting-places by force, whilst all the time they give vent to a low whistle, repeated every few seconds. The hole selected for the egg may be on the flat shore or at a height of two or three hundred feet up a cliff.

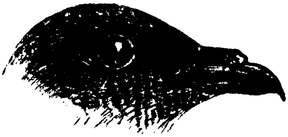


Fig. 50.—Head of *O. oceanicus.* 1

The egg is pure white, though sometimes much stained, the only markings consisting of a ring of faint reddish freckles round the larger end. Eighteen eggs measured by Eagle-Clarke and myself average 33·6 × 23·2 mm.: maxima **36·0** × **24·0** mm.; minima **31·8** × 23·4 and 32·6 × **21·8** mm. In shape they are almost elliptical and the texture is coarse and rather rough but very fragile. Most eggs are laid in January, a few as late as March.

When the birds are interfered with on the nest they emit an evil-smelling oily fluid through the mouth and nostrils.

Habits. Like other Petrels this bird is very local in its breeding-haunts, a great wanderer when the breeding-season is over. They are to be seen but seldom by day anywhere near land, even when breeding. At dawn they may be observed as they leave for the sea and at night, from 7 P.M. to 11 P.M., they fly backwards and forwards about the cliff in great numbers. In addition to their whistling notes these Petrels have a harsh, screaming chuckle. They feed on surface mollusca, animalculæ and other surface-matter. In appearance they are extremely fragile but with their wonderful powers of flight they seem at home in the wildest storms, whether on the wing or swimming lightly poised on the crest of some huge wave.

Genus FREGETTA.

Fregetta Bonaparte, Comp. Rend., xli, p. 1113 (1855).

Type by orig. desig., *Thalassidroma leucogastra* Gould.

This genus is very close to *Oceanites*, from which it differs in having the first phalanx of the middle toe greatly flattened and longer than the other phalanges and claw combined; the claws are flattened and broad, spade-shaped and pointed at the end.

Fregetta tropica.

Thallasidroma tropica Gould, Ann. Mag. Nat. Hist., xiii, p. 366 (1844).

Type-locality: South Indian Ocean.

The typical form differs from that which has occurred once in India, in having the lower parts less black, more brown.

(2195) Fregetta tropica melanogastra.

THE DUSKY-VENTED PETREL.

Thalassidroma melanogaster Gould, Ann. Mag. Nat. Hist., xiii, p. 367 (1844) (Is. of St. Paul).
Cymodroma melanogaster. Blanf. & Oates, iv, p. 355.

Vernacular names. None recorded.

Description. Upper tail-coverts and the bases of all but the centre pair of tail-feathers white; remaining upper parts blackish-brown, the crown darker and the quills and greater coverts almost black on the outer webs; chin and throat mottled white; breast brown; abdomen and posterior flanks white, the centre of the former mottled with dark brown; vent and under tail-coverts blackish with white bases to the feathers.

Colours of soft parts. Iris brown; bill and legs black.

Measurements. Wing 158 to 176 mm.; tail 73 to 81 mm.; tarsus about 40 to 43 mm., once 39 mm.; culmen 14 to 15 mm.

Distribution. Southern Seas of Australia, West to the Bay of Bengal, where one specimen was obtained. In the Atlantic North to the Tropic of Cancer.

Nidification. This Petrel has been found breeding in Kerguelen Island during March, laying one egg in a crevice in a rock. An egg is described by Mathews as "dull white, minutely and sparingly dotted all over with small pink dots" and measuring 37 × 27 mm. During the South Orkney Expedition a bird was caught in Laurie Island on December 5th on its nest, a hole in a rock, fifteen feet above the sea. The egg from this nest measured 36·0 × 25·5 mm.

Habits. Much the same as those of the preceding bird. The note is said to be a shrill piping uttered every few seconds by the birds on the wing.

Genus PUFFINUS.

Puffinus Brisson, Ornith., i, p. 131, vi, p. 130 (1766).

Type by taut., *Procellaria puffinus* Brunnich.

The Shearwaters are birds of moderate size with long, slender and compressed bills, much hooked at the point and with both mandibles turning down at the tip: the tubular nostrils end in two distinct, oblique orifices, directed forward and upward, with a broad division between them; the wings are long and pointed with the first primary longest; the tail is of twelve feathers, rather long and graduated; the tarsus is compressed and sharp in front, reticulated and shorter than the middle and outer toes, which are subequal; there is a small hind claw.

Key to Species.

A. No white on lower plumage.	
a. Legs and feet fleshy-white	*P. pacificus*, p. 303.
b. Tarsus outside and outer toe dark brown; inside and inner toes drab	*P. tenuirostris*, p. 304.
c. Legs and feet deep red	*P. carneipes*, p. 305.
B. Lower plumage partly or wholly white.	
d. Head, nape and neck much marked with white	*P. leucomelas*, p. 306.
e. Head, nape and neck with no white except round the eye and a streak behind it ..	*P. persicus*, p. 306.

Puffinus pacificus.

Procellaria pacifica Gmelin, Syst. Nat., i, (2) p. 560 (1789).

Type-locality: Pacific Ocean.

The typical form is rather larger and has a decidedly stouter bill than the Western form.

(2196) Puffinus pacificus hamiltoni.

THE WEDGE-TAILED OR GREEN-BILLED SHEARWATER.

Puffinus pacificus hamiltoni Mathews, Birds of Aus., ii, p. 82 (1912) (Seychelles).
Puffinus chlororhynchus. Blanf. & Oates, iv, p. 356.

Vernacular names. None recorded.

Description. Upper plumage dark brown, the head, wing-quills and tail almost black; lower plumage paler and more grey-brown, the chin and throat almost pure grey.

Colours of soft parts. Iris dark brown; bill dull fleshy or dusky greenish; legs and feet fleshy-white.

Measurements. Wing 274 to 290 mm.; tail 149 to 161 mm.; tarsus about 45 to 48 mm.; culmen about 36 to 39 mm.

Nestling in down pale grey, the throat and breast almost white.

Distribution. Breeding in Seychelles, Mauritius, Fouquet and Rodriguez; Western Indian Ocean generally when not breeding and has occurred several times in Ceylon between Panadure and Colombo. It was also seen by Legge off Trincomalie; whilst one is recorded by Cumming as having been shot near Omara on the Mekran coast in May 1899.

Nidification. This Petrel breeds on the shores of the islands named in the preceding paragraph, burrowing out a hole in the soil about one or two feet deep and some six inches in diameter. There is no nest, the single egg being placed in a rather larger chamber on the bare soil. The egg is the usual pure white in colour. The only eight I have been able to measure average 68·0 × 42·3 mm.: maxima **72·1** × 43·6 and 66·1 × **44·8** mm.; minima **65·0** × **39·1** mm.

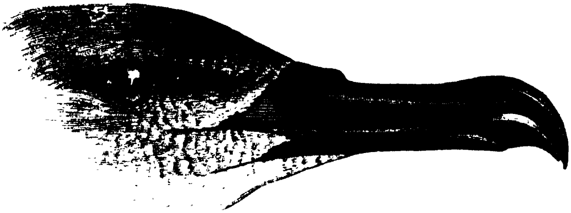


Fig. 51.—Head of *P. p. hamiltoni.* ¹⁄₁.

Both sexes assist in incubation but during the day one bird is always absent at sea; probably the female generally sits by day and the male by night.

The breeding-season is from December to February.

Habits. These Petrels are said to be very nocturnal or, at least, crepuscular in their habits, flying about more by night than day. They are powerful fliers and swimmers and feed by swimming and diving, taking small fish, cephalapods etc. as well as feeding much on surface animalculæ, which they take as they fly from the surface of the water. The call is a piping note, often heard at night.

(2197) Puffinus tenuirostris tenuirostris.

THE SLENDER-BILLED PETREL.

Puffinus tenuirostris Temm., Pl. Col., 99*e* livr., v, p. 387 (1835) (Japan).

Vernacular names. None recorded.

Description. Whole upper plumage sooty brown-black, the crown and primaries practically black; the former with paler inner webs, narrowly edged whitish; secondaries tinged with grey; feathers of the back with faintly paler edges; lower plumage rather paler, greyer brown, the chin and throat very grey.

Colours of soft parts. Iris brown; bill dark slate; legs and feet slate (*Tregellas*). Bill dark brown; tarsi outside and outer toe dark brown, inside of tarsus and inner toes light drab (*Scott*).

Measurements. Wing 258 to 280 mm.; tail 80 to 85 mm.; tarsus 49 to 52 mm.; culmen 31 to 34 mm.

Nestling in down. Brown, paler on the underparts.

Distribution. Japan Seas, Behring Straits and West Australia. Once obtained on the Mekran coast by Mr. Walter Scott, of the Indian Telegraph Service at Omara.

Nidification. None recorded.

Habits. Those of the genus.

(2198) Puffinus carneipes carneipes.

THE PINK-FOOTED SHEARWATER.

Puffinus carneipes Gould, P. Z. S., 1844, p. 57 (Cape Leeuwin, West Australia).

Vernacular names. None recorded.

Description. Upper plumage dark sooty-brown, the feathers faintly edged paler; the head, tail and wing-quills blackish; inner webs of primaries paler brown, narrowly edged still paler and base of shafts white; lores, a narrow line above the eye, sides of head and neck rather lighter brown, strongly tinged with grey, more especially on chin and throat.

Colours of soft parts. Iris brown; bill, feet and legs flesh-colour, the tip of both mandibles dusky and darker.

Measurements. Wing 299 to 316 mm.; tail 137 to 148 mm.; tarsus about 52 to 56 mm.; culmen 41 to 46 mm.

Distribution. Western Australian Seas. Once at Panadure in Ceylon in 1879. The skin of this bird was discovered in the Colombo Museum by Wait and sent home for comparison and for confirmation of his identification.

Nidification. The Pink-footed Petrel breeds from November to January, laying the usual one white egg at the bottom of a long burrow. The eggs are said to measure in length between 66 and 72 mm. and in breadth between 47 and 48 mm.

Habits. Those of the genus.

(2199) Puffinus leucomelas.

THE WHITE-FRONTED SHEARWATER.

Puffinus leucomelas Temm., Pl. Col., 587 (1836) (Seas of Japan).

Vernacular names. None recorded.

Description. Upper part of head, nape and neck dark brown, much mixed with wholly white feathers; the forehead and sides of the head white with dark brown centres to the feathers; in some specimens, possibly the oldest birds, the crown is nearly all dark brown; remainder of upper plumage dark brown, the mantle-feathers edged paler and in a few birds showing very fine white edges; upper tail-coverts paler and edged with white; wing-quills almost black; tail almost black, the outer feathers with a little white on the base of the inner webs; axillaries and lower plumage pure white.

Colours of soft parts. Iris dark brown; bill dark horn-colour; legs and feet flesh-colour, the outer toe darker.

Measurements. Wing 305 to 339 mm.; tail 131 to 150 mm.; tarsus 46 to 54 mm.; culmen 48 to 53 mm.

Distribution. Japanese Seas South and East to Borneo and once to Cape York in N.E. Australia. Once obtained at Mount Lavinia in 1884, the skin being now in the Colombo Museum.

Nidification. Unknown.

Habits. Hardly anything on record but, so far as is known, quite typical of the genus.

(2200) Puffinus persicus.

THE PERSIAN SHEARWATER.

Puffinus persicus Hume, Str. Feath., i, p. 5 (1873) (Persian Gulf); Blanf. & Oates, iv, p. 356.

Vernacular names. None recorded.

Description. A narrow ring round the eye and a streak behind it white; remainder of upper plumage dark brown, the rump and upper tail-coverts almost black, the forehead paler and slightly grey; lower plumage pure white; axillaries brown tipped with white; under wing-coverts and flanks below them mixed brown and white.

Colours of soft parts. Iris brown; bill dusky brown, bluish at the base and on three-fourths of the lower mandible; legs and feet white tinged with pink and lavender, the claws, margin of web, exterior of foot, outer toe and part of ridge black (*Hume*). The amount of black on the foot varies.

Measurements. Wing 185 to 209 mm.; tail 87 to 103 mm.; tarsus 31 to 33 mm.; culmen about 38 mm.

Distribution. The Arabian Sea and Persian Gulf from Aden to Bombay. Not rare off the Sind and Mekran coasts.

Nidification. Unknown.

Habits. Those of the genus, but very little is recorded about this rare Shearwater.

Genus DAPTION.

Daption Stephens, Gen. Zool. (Shaw), xiii, (1) p. 239 (1826).

Type by orig. desig., *Procellaria capensis* Linn.

In this genus the bill is short and stout, the gonys angulate near the end and the extremity inclined upwards; the nostrils are divided within the tube but terminate in a single orifice; the tarsus is slender, somewhat compressed, shorter than the middle toe and claw and reticulated throughout; the hind claw is strong; the tail of fourteen feathers is rather short and rounded at the end; the wings are long, with short secondaries and the first primary longest.

(2201) Daption capense.

THE CAPE PETREL.

Procellaria capensis Linn., Syst. Nat., 10th. ed., i, p. 132 (1758) (Cape of Good Hope).
Daption capensis. Blanf. & Oates, iv, p. 357.

Vernacular names. None recorded.

Description. Whole head, hind-neck, upper back and lesser wing-coverts slaty brown-black; remaining upper parts white, each feather broadly tipped with black; tail white with a broad black terminal band; primaries black, with the inner webs broadly white except at the tips; the white increases inwardly until the inner secondaries are white tipped with black; chin and sides of throat white spotted with slate-brown; remainder of under plumage white with a few spots on the sides of the neck, flanks and under tail-coverts; axillaries white; under wing-coverts white in the centre, slate-grey all round.

Colours of soft parts. Iris brown; bill black, the skin between the rami red; legs and feet black.

Measurements. Wing 240 to 268 mm.; tail 92 to 108 mm.; tarsus 42 to 46 mm.; culmen 29 to 32 mm.

Nestling in down dark sooty-grey above, paler below.

Distribution. Southern Circumpolar Seas. Once obtained in the Gulf of Manaar, between Ceylon and the Mainland.

Nidification. The Cape Petrel breeds in the South Orkneys and Shetlands during December, laying a single pure white egg on ledges on cliffs or, rarely, among small stones on the heaps fallen along the foot of the cliffs. There is no nest, though Dr. Pirie, during the South Orkney Expedition of 1903, found that the birds collected a few chips of rock and small lumps of earth for the eggs to lie on. Some eggs were found laid in hollows in the earth of the sides of the cliffs but these were open, not deep crevices like those occupied by Wilson's Petrel. The birds were very numerous and very sociable, several often nesting close together, whilst others had their nesting-places well apart and alone. Eagle-Clarke gives the average "of a large number" as 62·35 × 43·11 mm.; including eight eggs taken by Bennett, the average of forty eggs measured by myself is the same. Maxima **67·2** × 45·2 and 64·0 × **46·5** mm.; minima **56·5** × 42·1 and 64·0 × **39·5** mm.

The birds sit close and have to be forcibly removed from their eggs and when disturbed have the Petrel's usual habit of ejecting a foul-smelling oil over the intruder.

Habits. Similar to those of other Petrels.

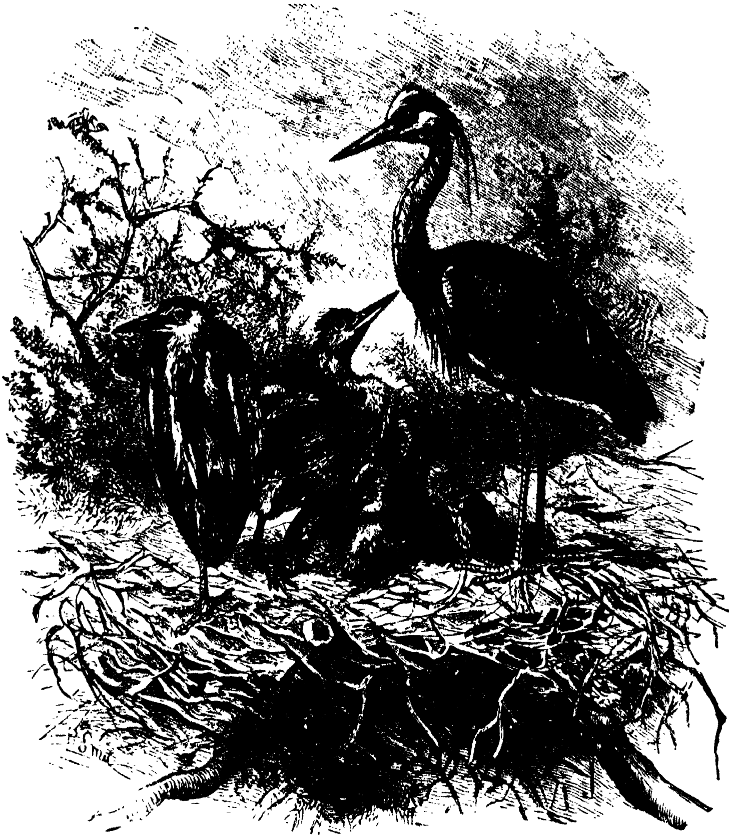


Fig. 52.—*Ardea c. cinerea* and young. (From the group in the British Museum.)

Order XII. HERODIONES.

Blanford retained in this Order, which is equivalent to the *Gressores* of some systematists and to part of the *Gallæ* of Linnæus, four groups of birds: (1) the *Ibididæ*, or Ibises; (2) *Plataleidæ*, or Spoonbills; (3) *Ciconiidæ*, or Storks and (4) *Ardeidæ*, or Herons. The last two groups Blanford placed in separate suborders and the first and second in one suborder. Although many modern authors only give the various groups family status, the three suborders are well differentiated and are convenient to the student, so I maintain them here.

In outward appearance some of the species bear a superficial resemblance to the Cranes etc., which found a place in Linnæus's *Grallæ*, that is to say, they are Waders with long bills, necks and legs. Structurally, however, the *Herodiones* are very widely separated from the *Grues*, whilst the young are born helpless and not in the least like the active, alert and capable young of that group. In anatomy the *Herodiones* resemble in many respects the *Steganopodes*, as in the characters of the palate.

In the *Herodiones* the skull is desmognathous and the basipterygoid processes are wanting; the nostrils are pervious; there are two carotids; the cæca are rudimentary; the oil-gland present and tufted and the wing aquincubital; the plantar tendons vary, in most genera they are Galline in character but in some the vinculum is weak or absent, the flexor longus hallucis passing freely to the hallux, as in the Passeres; an aftershaft is present in most genera but is absent in some of the Storks. The tibia, except in some of the Herons, is bare or partly bare; the toes are long, with the hind toe well developed and not raised above the other toes.

Key to Suborders.

A. Schizorhinal; accessory femoro-caudal present, sternum with four posterior incisions: syringeal muscles present .... **Plataleæ**, p. 310
B. Holorhinal; no accessory femoro-caudal; sternum with two posterior incisions.
  a. No intrinsic muscles to the syrinx; dorsal apterium not extending to neck .... **Ciconiæ**, p. 320.
  b. A pair of intrinsic muscles to syrinx; dorsal apterium extending up back of neck ...... **Ardeæ**, p. 335.

Suborder PLATALEÆ.

The members of this family are schizorhinal, an exceptional character among desmognathous birds, and the posterior portion of the mandible is prolonged behind the quadrate, as in the *Anseres*, and recurved. In the sternum there are four incisions, two on each side of the posterior border; the cervical vertebræ are seventeen in number; all the muscles of the thigh are present, including the accessory femoro-caudal, which is wanting in the Storks and Herons; a pair of intrinsic syringeal muscles (tracheo-bronchial) present as in the *Ardeæ*.

This suborder may be conveniently divided into two families.

Key to Families.

A. Bill straight, flattened and dilated at the end . **Plataleidæ** p. 311.
B. Bill curved downwards .... **Ibididæ** p. 314.

Family PLATALEIDÆ.

The Spoonbills are very closely related to the Ibises but they are less conspicuously schizorhinal. There is only one genus, *Platalea*, of which one species is found in India.

Genus PLATALEA.

Platalea Linn., Syst. Nat., 10th ed., i, p. 139 (1758).

Type by mon., *Platalea leucorodia* Linn.

In this genus the bill is a very striking feature; both mandibles are greatly flattened, becoming broader and spoon-shaped on the tip, where they are slightly turned down; the nostrils are placed in grooves near the base, the grooves diverging from the nostrils and running down each edge of the upper mandible; face naked; legs long, the tibia only feathered above, tarsus reticulated throughout; toes long, bordered by a membrane and webbed at the base.

Platalea leucorodia.

Platalea leucorodia Linn., Syst. Nat., 10th ed., i, p. 139 (1758).

Type-locality: Europe.

The typical form differs from the Asiatic in having a slightly shorter bill and in being a little smaller. The dimensions overlap and *P. l. major* is a poor subspecies.

(2202) Platalea leucorodia major.

THE INDIAN SPOONBILL.

Platalea major Temm. & Schleg., Faun. Japon., p. 119 (1848) (Japan).
Platalea leucorodia. Blanf. & Oates, iv, p. 366.

Vernacular names. *Chamach Baza* (Hind.); *Ghinta* (Beng.); *Gentu muku konga* (Tel.); *Chapy Chundun* (Tam., Ceylon); *Khantiya-bog* (Assam).

Description. A patch on the fore-neck cinnamon-buff or tawny; remainder of plumage, including long and thick nuchal crest, pure white.

Colours of soft parts. Iris dark brown; bill black, the terminal half of the spoon bright yellow; bare skin of face yellow, sometimes blotched with black on and above the lores; legs and feet black.

Measurements. Wing 350 to 395 mm.; tail 108 to 122 mm.; tarsus 130 to 165 mm.; culmen 180 to 228 mm.

In non-breeding plumage the crest is moulted.

Young birds have the primary wing-coverts tipped with black, much of the first three primaries blotched and mottled with black, all black-shafted and the fourth and fifth with black tips.

Distribution. India and Ceylon to Japan. Afghanistan and Baluchistan. West to Persian Gulf and Mesopotamia.

Nidification. The Spoonbills breed throughout India as far East as Eastern Bengal but not in Assam. In Ceylon they breed in March; in Northern India most birds lay from September to November; in Sind sometimes as early as August, whilst from Satara, in Bombay, I have eggs taken by Betham at the end of January. The birds breed in colonies, often of great size and often in company with colonies of Open-bills, Herons, Ibises etc., though they usually select a cluster of trees slightly apart from the others. As long as the trees are close to water they do not seem to mind where they grow and the trees selected are quite as often standing in villages as away from them. The nests are large, stick structures built near the tops of the trees and are used year after year by the birds. The eggs number three to five and though eight have been found in a nest, these are probably the produce of two birds. The eggs have a pure white ground-colour and are blotched sparingly and principally at the larger end with deep red-brown. Secondary markings are scarce but occasionally there are a few light reddish subshell blotches. Forty eggs average 65·6×44·2 mm.: maxima 72·1×45·1 and 70·0×47·7 mm.; minima 61·1×45·3 and 61·4×41·0 mm.

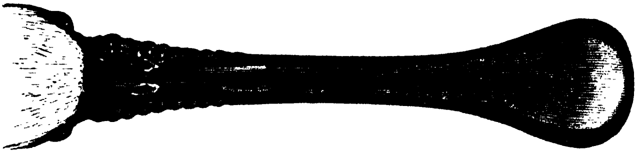


Fig. 53.—Bill of *P. l. major*. ⅓.

Habits. The Spoonbills are resident throughout India but move locally under the pressure of weather. In serious droughts they will leave some districts altogether, simply because no food is obtainable and at certain times, as in Sind, their numbers are greatly increased by visitors from elsewhere. In Sind, Ticehurst found these birds very wild but in most parts of India, as in Sind sometimes, they are extremely tame and confiding. They are very silent birds, a low guttural croak being the only sound they make. They fly well but slowly with regular flapping, can move with some speed on land and are good swimmers. They feed for the most part on small fish, tiny eels, frogs, newts, tadpoles etc. but will also devour all insects and are said to eat a good deal of vegetable matter. In the breeding-season they feed early in the mornings and late in the afternoons and they are rather crepuscular in their habits at all times.

Family IBIDIDÆ.

The members of this family have the bill long, curved downwards, rather like the Curlews, and compressed at the sides; on each side of the culmen there is a long groove, at the base of which the nostril is placed.

Three genera of this family and four species are found in India and the family itself occurs over the greater part of the Old World.

Key to Genera.

A. Tarsus covered with hexagonal scales.
  a. Whole head and neck naked in adults; plumage nearly all white .... THRESKIORNIS, p. 314.
  b. Head naked and neck feathered in adults; plumage mostly glossed black .... PSEUDIBIS, p. 315.
B. Tarsus with transverse scutellæ in front; head feathered in adults and only the face naked .... PLEGADIS, p. 318.

Genus **THRESKIORNIS.**

Threskiornis Gray, List Gen. Birds, App., p. 13 (1842).

Type by orig. desig., *Tantalus æthiopicus* Latham.

In *Threskiornis* the head and neck are naked in the adult; the bill curved deeply downwards, stout, blunt and with a linear nostril; the tibia is only feathered on the upper half; the tarsus reticulated; the toes are long, webbed between the bases and bordered by a membrane to the claws; tail fairly long, of twelve feathers; in the breeding-season the inner secondaries are longer than the primaries and are disintegrated, forming ornamental plumes.

The genus ranges from Africa through India and the Malay countries and islands to Australia. One species is Indian.

(2203) **Threskiornis melanocephalus.**

THE WHITE IBIS.

Tantalus melanocephalus Lath., Ind. Orn., ii, p. 709 (1790) (India).
Ibis melanocephalus. Blanf. & Oates, iv, p. 361.

Vernacular names. *Munda, Safed Baza, Didhar* (Hind.); *Kachator* (Purnea); *Sabut Baza, Do-chora* (Beng.); *Tatu-koka* (Cing.); *Kayusoti* (Burm.); *Boga-akoki-bog* (Assam).

Description.—Breeding plumage. The ends of the inner secondaries and sometimes a few of the longest scapulars silvery slaty-grey with black shafts; all but the first primary with black shafts; remainder of plumage white; the feathers round the base of the neck are long and plume-like and the inner secondaries very long and much disintegrated.

Colours of soft parts. Iris red-brown or red; bill black; naked skin of whole head and neck bluish-black; bare skin of flanks and under-wing blood-red; legs and feet glossy black.

Measurements. Wing 343 to 370 mm.; tail 133 to 145 mm.; tarsus about 99 to 115 mm.; culmen 139 to 170 mm.

In non-breeding plumage the long inner secondaries and neck-plumes are shed for ordinary ones.

Young birds have the upper part and sides of the head and nape covered with brown feathers; the face and round the eye are bare, and the rest of the chin, throat and whole neck are covered with short disintegrated white feathers.

Distribution. India, Ceylon, Burma and China to South Japan.

Nidification. In Ceylon the White Ibises breed in March, whilst in the rest of India they do not commence to nest until the Rains break, most eggs being laid in August and September. They build their nests in colonies on trees, generally half a dozen to a dozen pairs but sometimes ten times this number. The nests are rather small in diameter, some 18 to 24 inches but are deep in proportion and are remarkable for the manner in which the birds build them in little groups, half a dozen nests touching, or almost touching, one another. The trees selected are always near, and often in, water but the birds do not seem to mind whether they are alongside villages or far from civilization. The eggs number two to four, most often three, and in colour are a pale, rather dull bluish-white, occasionally with a few flecks or smears of dull pale reddish. One hundred and fifty eggs average 63·5 × 43·1 mm.: maxima **70·3** × **49·2** mm.; minima **56·8** × **37·6** mm.

Habits. This Ibis may be found all over India wherever there are large rivers, lakes and swamps, though, like the preceding and many other birds, it moves locally according to its food-supply. This consists principally of small fish, but also of frogs, worms, insects, small mollusca and small crustacea. According to Doig it has a remarkably loud booming call during the breeding-season but it is a very silent bird and few people seem ever to have heard its note.

Genus **PSEUDIBIS**.

Pseudibis Hodgs., Zool. Misc. (Gray), p. 86 (1844).

Type by mon., *Ibis papillosus* Rüppell.

In this genus the head and nape only are naked in the adults; the bill is more slender than in *Threskiornis*, the feet shorter and the plumage principally black instead of white; the inner secondaries are normal in shape and neither lengthened nor disintegrated and there are no long neck-plumes in the breeding-season.

Sharpe, in the Catalogue of Birds, divided *Inocotis* (=*Pseudibis*) into two genera, making *davisoni* the type of his genus *Graphtocephalus*, which he separated from *Inocotis* because of its smooth crown. This, however, seems to me to be only a matter of degree, for an examination of the crown of *davisoni* shows most distinctly small carunculations everywhere, though not projecting into small spicules or papillæ as in *papillosus*. In all other respects the two forms seem quite congeneric, whilst in plumage they are identical. It is even doubtful whether they should not be treated as geographical subspecies of the same species.

Key to Species.

A. Papillæ of crown and nape much developed and red in colour	*P. papillosus*, p. 316.
B. Papillæ of head obsolete and not coloured red	*P. davisoni*, p. 317.

(2204) Pseudibis papillosus.

THE INDIAN BLACK IBIS.

Ibis papillosus Temm., Pl. Col., pl. 304 (1824) (India).
Inocotis papillosus. Blanf. & Oates, iv, p. 302.

Vernacular names. *Baza, Kala Baza, Karan-kal* (Hind.); *Nella kankanum* (Tel.); *Kala-akohi-bog* (Assam).

Description. Neck, mantle, lower back, rump and lower plumage brown, the scapulars and back with a bronze-green gloss; tail black, richly glossed with blue-green; a patch of white on the inner lesser wing-coverts; remainder of wing black, glossed richly with deep blue or purple-blue.

Colours of soft parts. Iris dull to bright orange-red; bill plumbeous-green or dull green; naked skin of head black, a mass of brilliant red papillæ covering the skin from a point above the forehead and cut off square at the back of the nape; legs and feet brick-red.

Measurements. Wing 365 to 400 mm.; tail 165 to 194 mm.; tarsus about 75 to 85 mm.; culmen 138 to 158 mm.

Young birds have no papillæ but have that portion of the crown and also the head and throat covered with dull brown feathers, the wings and tail are glossless brown and the feathers of the upper parts have rufescent margins.

Distribution. The plains of Northern India, South to Mysore, except on the Western coast. It is said not to occur in Bengal and Assam but Godwin-Austin obtained it in Mymensingh, whilst I knew of a pair in Dacca and obtained one specimen in Sylhet. Blyth also records it as having occurred in Arrakan.

Nidification. The Black Ibis breeds all over India and at almost all times. In Bombay Davidson found it breeding in May and again from November to January; through most of Northern India eggs have been taken in every month from March to December but most birds lay either in April and May or after the rains commence from July to September. Unlike other Ibises they do not breed in colonies or with other birds, though rarely one or two to four nests may be found in the same tree, whilst in Sind they are said to breed in colonies of some size. Occasionally they make use of old nests of Vultures. They lay from two to four eggs, the latter exceptional, which are dull pale blue in colour, sometimes immaculate but generally with a few blotches and splashes of light brown. Fifty-six eggs average 63·0 × 43·8 mm.: maxima **70·3** × 44·2 and 65·4 × **49·9** mm.; minima **56·0** × 43·0 and 63·5 × **38·0** mm.

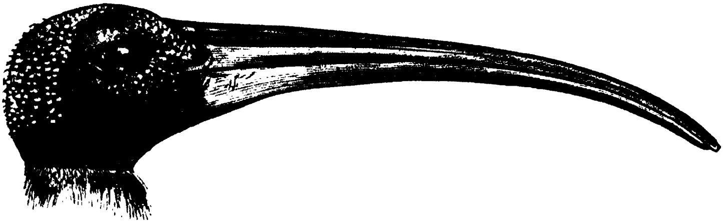


Fig. 54.—Head of *P. papillosus*. ½.

Habits. The Black Ibis is found more often in open dry cultivation than in marshy land, though it sometimes visits the latter and hunts for frogs. It very seldom wades and fish do not form any part of its diet which is principally insectivorous, though it will also eat most kinds of ripe grain and it has been known to kill and devour small snakes. During the breeding-season it utters a harsh, loud croak but, like the rest of the family, it is a very silent bird; Bell likens its call to that of "a bird-of-prey, a screaming two- or three-note cry."

(2205) Pseudibis davisoni.

Davison' Black Ibis.

Geronticus davisoni Hume, Str. Feath., iii, p. 300 (1875) (Tenasserim).
Inocotis davisoni. Blanf. & Oates, iv, p. 364.

Vernacular names. None recorded.

Description. In plumage exactly like the preceding bird.

Colours of soft parts. Iris orange-red; bill bluish or plumbeous-blue; the skin of the head is black and there are no papillæ, though the skin, more especially on the forehead and fore-crown, shows some corrugations and obsolete papillæ coloured paler than the forehead itself; the hind-nape, running forward to the ears and joining on the throat, pale blue; legs and feet pale coral-red.

Measurements. Wing 393 to 428 mm.; tail 192 to 208 mm.; tarsus about 91 to 99 mm.; culmen 156 to 192 mm.

Young like those of the preceding bird.

Distribution. Eastern Upper Burma to Pegu, Tenasserim, Cochin China and Siam.

Nidification. Oates found this Ibis breeding in Pegu in February, whilst Grant and Packard obtained eggs at Myingyan, Upper Burma, in March. In each case there were two hard-set eggs in the nest and the latter was placed in a tree between fifteen and thirty feet from the ground. The eggs are not distinguishable from those of the preceding bird and seven average 63·0 × 43·2 mm.

Habits. Quite similar to those of *Inocotis papillosus*, though this bird may perhaps be met with more frequently in marshy land. The call is said to be loud, harsh and strident, though seldom uttered, and its food to consist principally of locusts, grasshoppers and seeds. It is a solitary bird, found in pairs only, and neither breeds in colonies nor together with Herons and other birds, nor does it associate with others when feeding.

Genus PLEGADIS.

Plegadis Kaup., Skizz. Entwick. Nat. Syst., p. 82 (1829).

Type by mon., *Tantalus falcinellus* Linn.

In this genus the head is feathered except on the lores and a small area in front of the eye. The tarsi are lengthened and scutellated in front; the toes are long and slender; the bill is much more slender than in *Pseudibis*.

The single species contained in this genus has a wide range in Indo-Burma, Western Asia, Europe etc.

(2206) Plegadis falcinellus falcinellus.

The Glossy Ibis.

Tantalus falcinellus Linn., Syst. Nat., 12th ed., i, p. 241 (1766) (Austria).

Plegadis falcinellus. Blanf. & Oates, iv, p. 364.

Vernacular names. *Kawari*, *Kowar*, *Chota Baza* (Hind.); *Kala Kachiatora* (Beng.); *Tati-kankaram* (Tel.); *Karapu-Kotan* (Tam., Ceylon); *Rata datuduwa* (Cing.).

Description.—Breeding plumage. Crown, sides of head, chin and fore-throat with purple and green gloss; neck all round, upper back, scapulars and innermost wing-coverts dark, rich chestnut; lower back, rump and upper tail-coverts glossy purple-green; tail black, glossed green at the base, purple elsewhere;

median wing-coverts glossy purple, remainder of wing glossy green; axillaries and under tail-coverts deep purple; remainder of lower plumage chestnut.

Colours of soft parts. Iris grey, brown or mottled grey and brown; bill dark livid or plumbeous-brown; naked skin of face and round eye livid; legs and feet bronze-brown, bluish above the knee.

Measurements. Wing 248 to 298 mm.; tail 94 to 106 mm.; tarsus about 85 to 110 mm.; culmen 99 to 144 mm.

In non-breeding plumage the scapulars and innermost wing-coverts are glossy green-blue and the head and neck are brown streaked with white.

Young birds are like the adult in winter but have the lower plumage all brown and the upper parts much less glossy; the upper back is brown like the neck but not streaked with white.

Distribution. Southern Europe, a great part of Africa to Central Asia, Persia, Baluchistan, Afghanistan, India, Burma and Ceylon.

Nidification. The Glossy Ibis breeds wherever there are suitable tracts of marsh and swamp but not in the hills and not in desert or barren areas. It is common in Sind, but there keeps to the canals and swamps; it also breeds in the Rann of Cutch and there are breeding colonies in Oude, Ceylon, Orissa, Manipur, Assam and Burma. These colonies are of considerable size and are usually associated with breeding colonies of other Ibises, Herons, Cormorants etc., nests of several species being often found on the same tree. The nests are of sticks, sometimes unlined, sometimes lined with grass and straw; in size they may be some 12 inches across by less than half that in depth. The eggs number two to five, three being most common and they are the most beautiful of all the eggs of this and allied orders, being in colour a deep unspotted blue. One hundred eggs average 52·18 × 36·9 mm.: maxima **57·8** × 38·0 and 57·5 × **43·0** mm.; minima **46·2** × 33·9 and 50·0 × **33·5** mm.

In Ceylon the birds lay in January and February but everywhere else in the end of April to early June.

Habits. The Glossy Ibis is resident in India but moves about locally in an extraordinary manner. In many places it is present only in the breeding-season and in others only a non-breeding visitor, whilst it is difficult to assign any reason for the majority of the movements. It likes large masses of water, yet avoids, as a rule, the wettest as well as the driest areas. It does not breed in the desert country of Rajputana, Sind or the Punjab but neither is it found in the wettest parts of Bengal, Assam and Burma. It is essentially a marsh-bird, not frequenting dry cultivated fields or open meadows and it feeds on small mollusca, crustacea, worms and insects. When disturbed it is said to utter a harsh croak. It is a sociable bird at all times and is very tame and confiding.

Suborder **CICONIÆ.**

The Storks differ, among other characters, from the Ibises in being holorhinal instead of schizorhinal, whilst from the *Ardeæ* they are distinguished principally in having no intrinsic muscles to the syrinx. The mandible is not produced beyond its articulation with the quadrate; there is only one incision on each side of the posterior border of the sternum and the cervical vertebræ number seventeen; the ambiens muscle when present is always small and sometimes altogether wanting; the accessory femoro-caudal is absent, whilst the femoro-caudal is sometimes present, sometimes wanting; the dorsal bare tract does not extend to the neck; there are no powder-down patches; the middle toe is not pectinated.

Having no tracheo-bronchial muscles to the syrinx Storks are destitute of all voice, though some are said to be able to make a kind of grunting noise.

The *Ciconiæ* contain one Indian family, which is cosmopolitan.

Family CICONIIDÆ.

Bill stout and long, with no distinct grooves on each side of the upper mandible; wings long and broad; tail rather short; legs very long, the tibia half naked and the tarsus reticulated with hexagonal scales; toes of moderate length; the three anterior toes united by webs at their bases; hind toe not raised above others; claws generally short, broad and blunt.

Key to Genera.

A. Centre of mandibles touching one another and showing no open space.	
a. Bill straight.	
a'. Forehead, crown and cheeks feathered.	Ciconia, p. 321.
b'. Crown feathered; forehead and cheeks naked	Dissoura, p. 324.
c'. Whole head and most of head naked.	Leptoptilus, p. 327.
b. Bill slightly curved up at the end; the head feathered	Xenorhynchus, p. 326.
c. Bill curved down at the end. Head naked	Ibis, p. 331.
B. A wide open space between the mandibles in the centre	Anastomus, p. 332.

Genus CICONIA.

Ciconia Brisson, Ornith., i, p. 48, v, p. 361 (1760).

Type by taut., *Ardea ciconia* Linn.

The typical Storks have a long, stout, tapering and pointed bill, the lower mandible slightly inclined upwards towards the end; nostrils almost linear, basal and pervious; some naked orbital skin but surrounded by feathers; lower half of tibia naked; tarsi long and reticulated; feet short with broad toes; claws very short, broad and depressed.

Key to Species.

A. Head, neck and back white	*C. ciconia*, p. 321.
B. Head, neck and back black or dark brown	*C. nigra*, p. 323.

Ciconia ciconia.

This species has been divided into three races, one of which, *C. c. boyciana*, is easily distinguishable by its black beak. On the other hand, *C. c. asiatica* is separated only on account of its supposedly larger size and larger bill; the specimens I have been able to measure do not support this separation and I therefore consider *C. c. asiatica* to be merely a synonym of *C. c. ciconia*.

Key to Subspecies.

A. Bill red	*C. c. ciconia*, p. 321.
B. Bill black	*C. c. boyciana*, p. 322.

(2207) Ciconia ciconia ciconia.

THE WHITE STORK.

Ardea ciconia Linn., Syst. Nat., 10th ed., i, p. 142 (1758) (Sweden).
Ciconia alba. Blanf. & Oates, iv, p. 369 (part.).

Vernacular names. *Lag-lag*, *Haji Lag-lag*, *Ujli*, *Dhak*, *Ghybur* (Hind.); *Wadumi Konga* (Tel.); *Lak-lak* (Sind).

Description. Longer scapulars, greater and primary coverts black; primaries black with the extreme base white; outer secondaries black, the outer web silvered over with grey except at the edge; remainder of plumage white; the feathers of the head, neck and breast long and lanceolate.

Colours of soft parts. Iris brown; the orbital skin black; bill blood-red; legs and feet red.

Measurements. ♂: wing 530 (*Witherby*) to 635 mm.; tail 215 to 240 mm.; tarsus 195 to 240 mm.; culmen 150 (*Witherby*) to 220 mm. (*Hartert*); ♀: wing 530 to 590 mm.; culmen about 140 to 175 mm.

Young birds. Like the adult but the black parts are brown or tinged brown and some of the shorter scapulars have brown centres.

Nestling in down all white.

Distribution. Europe, Northern Africa and Western Asia to Lake Baikal, Turkestan, Persia etc. In Winter South to North-West India commonly and thence Southwards, but rare South of the Deccan, though occurring as far South as Ceylon.

Nidification. The White Stork breeds from March in the South to late May in Scandinavia, building a nest of sticks on the top of some building, tall tree or rock. Over a great part of Europe it selects farmhouses and other inhabited buildings but in Africa many nests may be seen on the ruins of the ancient and half-buried cities of the desert. It formerly frequently built on buildings in Scandinavian towns but better drainage and stricter ideas as to cleanliness have forced the birds to leave for places where scavenging is more profitable. The nests are occupied, repaired and added to year after year until they are of huge dimensions. The eggs number three to five and are pure white with a smooth texture, generally, but not always, rather pitted. One hundred and twenty eggs average 73·2 × 58·8 mm.: maxima **81·5** × 46·5 and 71·7 × **55·7** mm.; minima **65·5** × 49·6 and 81·5 × **46·5** mm. (*Jerdon* and others).

Habits. The White Stork is only a Winter visitor to India and is not uncommon in Sind and the North-West, straggling South to the Deccan and to Ceylon, where however it does not breed, whilst East it occurs as far as Behar. It arrives in small flocks but single birds and pairs are often seen. It keeps in India to wide, open plains and marshes, feeding on all sorts of reptiles, fish and large insects. The flight is powerful but leisurely and it often soars with unmoving outspread wings like a Vulture. It has no voice beyond a low hissing but makes a loud clapping noise when excited by snapping its mandibles together repeatedly.

(2208) Ciconia ciconia boyciana.

THE EASTERN WHITE STORK.

Ciconia boyciana Swinh., P. Z. S., 1873, p. 513 (Yokohama).
Ciconia alba. Blanf. & Oates, iv, p. 369 (part.).

Vernacular names. None recorded.

Description. Differs from the preceding race only in having a larger bill all black or nearly so, and in being rather larger.

Colours of soft parts. Iris rosy-pink with an outer ring of black (*Dav. et Ous.*). Bill black, in breeding-season tinged purplish at base; other parts as in the typical form.

Measurements. Wing 620 to 670 mm.; culmen 195 to 222 mm.

Distribution. Eastern Asia from Ussuri and Amur to Japan and Korea. It occurs in Burma, Manipur and Assam, whilst a pair I once saw in Kulna in Bengal had conspicuous black bills and must have been of this race.

Nidification. Apparently similar to that of the Common Stork but its eggs are said to be rather larger, measuring about 75·2 × 58·1 mm. It breeds on lofty trees or occasionally on rocks and probably returns year after year to the same nest.

Habits. Much the same as those of the preceding bird but not so familiar and confiding in its habits. At the same time, in Northern China it is said to frequent villages, where it may occasionally be seen stalking through the streets or perched high up on a minaret or roof, silent and dignified on one foot.

(2209) Ciconia nigra.

THE BLACK STORK.

Ardea nigra Linn., Syst. Nat., 10th ed., i, p. 142 (1758) (N. Europe).

Ciconia nigra. Blanf. & Oates, iv, p. 369.

Vernacular names. *Surmal* (Hind.).

Description. Lower breast, abdomen, flanks and under tail-coverts white; remainder of plumage black, highly glossed with varying colours; the upper parts with purple, bronze and green, the neck almost entirely brilliant green, the back and mantle nearly all purple and deep bronze, the breast mixed green and purple.

Colours of soft parts. Iris brown or black; bill red, paler at the tip; bare skin of face deep red; legs and feet coral scarlet-red.

Measurements. Wing 520 to 605 mm.; tail 190 to 240 mm.; tarsus about 180 to 200 mm.; culmen 160 to 190 mm.

Young birds. Head, neck and upper breast dark brown, each feather tipped paler; mantle brownish-black with very little gloss.

Distribution. Breeding in Germany, Austria and Eastern Europe to North Central Asia, wintering in Africa, India and China. It has not occurred in Ceylon or in India South of the Deccan. In the East it is a regular, though not common, visitor to Assam.

Nidification. The Black Stork breeds in April and May, making a stick nest in cliff faces or on trees, never on buildings nor on trees in or close to habitations. The nest is well lined with moss, wool or soft rubbish of any kind and is used for many years in succession if the birds are not harried. The eggs are small replicas of those of the White Stork. One hundred eggs (84 Jourdain) average 65·3 × 48·7 mm.: maxima 74·3 × 47·5 and 69·4 × 51·7 mm.; minima 60·3 × 45·2 mm.

Habits. Very similar to those of *Ciconia ciconia*, but it is a bird of open plains away from the vicinity of towns and villages. It is an omnivorous feeder like most Storks and will eat almost any living thing which comes within its ken. It occurs in India in larger flocks than the preceding bird and seems to prefer marshes and wet ground to dry plains or cultivation.

Genus DISSOURA.

Dissoura Cabanis, Preuss. Staats-Anz. Beit., p. 1484 (1850).

Type by orig. desig., *Ardea episcopus* Bodd.

This genus differs from *Ciconia* in having the forehead and sides of the head to behind the eye naked; the upper tail-coverts are stiff and bifurcating, the exterior coverts longest and reaching nearly to the tip of the tail.

It contains but one species.

(2210) Dissoura episcopa episcopa.

THE WHITE-NECKED STORK.

Ardea episcopus Bodd., Pl. Enlum., p. 54 (1783) (India).
Dissoura episcopus. Blanf. & Oates, iv, p. 370.

Vernacular names. *Manik-jor*, *Lag-lag* (Hind.); *Bagula* (Mahr.); *Sanku-budi-konga* (Tel.); *Mana-koku*, *Vanatay-koku* (Cing.); *Chi-gyin-sut* (Burm.); *Kanua* (Assam).

Description. Face from behind the eye naked; crown black, glossed with green; neck all round white; posterior abdomen, under tail-coverts and tail white; remainder of plumage black; lesser wing-coverts and breast glossed with purple, this gloss sometimes also covering the whole of the upper back; rest of plumage above glossed with deep green-blue; abdomen glossed with bronze-green.

Colours of soft parts. Iris crimson; bill black, tinged with crimson-red at the tip, edges of commissure and gape; naked skin of face, chin and throat plumbeous-black; legs and feet red.

Measurements. Wing 444 to 497 mm.; tail 199 to 225 mm.; tarsus about 152 to 180 mm.; culmen 145 to 168 mm.

Young birds have the glossy black replaced by dull dark brown, unglossed; the feathers of the neck are longer and more fluffy.

Distribution. All India, Ceylon, all Burma to Siam, Cochin China, Malay Peninsula and Archipelago to Java and the Celebes. I cannot separate *neglecta** of Finsch. The amount of naked skin on the throat varies greatly according to age. Young birds have even the face lightly feathered, whilst old birds have a space running back from the ear-orifice down the side of the neck for an inch or more. Such specimens are represented in the British Museum collection from Oude, Ceylon, Upper Burma, Malay States and Java.

Whistler says that he found this Stork not uncommon in the Punjab but it has only once occurred in Sind, though it breeds South of Sind in Cutch.

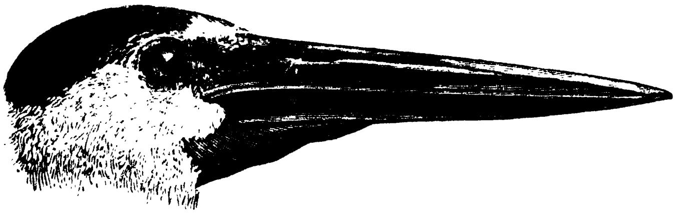


Fig. 55.—Head of *D. e. episcopa.* ½.

Nidification. The White-necked Stork breeds in Southern India from the end of December to March but in Northern India principally from June to September, whilst Inglis took eggs in Behar in May and Butler took others in Deesa in October. The nest is a typical small Stork's nest made of sticks, lined with grass and rubbish and placed fairly high up in a tree. These birds do not breed in colonies but occasionally two or three nests may be found close to one another. The eggs number three or four and are white obtuse ovals with a rather smooth texture but no gloss. Ninety eggs average 62·9 × 47·4 mm.: maxima **67·4** × 48·4 and 67·2 × **49·0** mm.; minima **57·0** × 46·0 and 61·0 × **43·6** mm.

Habits. This Stork frequents open plains and cultivated tracts as well as marshes and ponds, feeding on all sorts of reptiles, molluscs, crabs, worms, large insects etc. Like all Storks it also eats any small mammals or young and wounded birds which may chance to cross its path though it does not hunt for these. It may often be seen soaring round in the sky, generally in pairs but sometimes in small flocks. It makes a loud clattering noise with its bill, after the fashion of the family but is said also to make a deep grunting note as well as the usual hiss.

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* Finsch, Orn. Monatsbr., p. 94 (1904) (Java).

Genus **XENORHYNCHUS.**

Xenorhynchus Bonaparte, Compt. Rend., xl, p. 721 (1855).

Type by mon., *Mycteria asiatica* Latham.

In the genus the bill is very long and curved slightly upwards at the tip; tarsus very long; head and neck completely feathered.

The genus contains but one species, which is found from India to Australia.

(2211) **Xenorhynchus asiaticus asiaticus.**

THE BLACK-NECKED STORK.

Mycteria asiatica Lath., Ind. Orn., ii, p. 670 (1790) (India).
Xenorhynchus asiaticus. Blanf. & Oates, iv, p. 372.

Vernacular names. *Banaras, Loharjang, Loha sarang* (Hind.); *Ram salik* (Beng.): *Peria koku* (Tam., Ceylon); *Al-koka* (Cing.); *Telia-herenga* (Assam); *Hnet-kalah* (Burm.).

Description. Head and neck black, the occiput and nape glossed with copper-bronze, the rest with brilliant green-blue and with purple where the bronze and green meet; back, scapulars, innermost secondaries and median wing-coverts black glossed with green; remainder of plumage white.

Fig. 56.—Head of *X. a. asiaticus.* ⅓.

Colours of soft parts. Iris dark brown, yellow in the female; bill black; naked skin of pouch and eyelids dull purple; legs and feet coral-red.

Measurements. Wing 565 to 645 mm.; tail 257 to 281 mm.; tarsus about 300 to 333 mm.; culmen 298 to 324 mm.

Young birds have the head, neck and mantle brown, the feathers with pale edges; some of the scapulars darker and slightly glossy; quills dark brown with white bases; lower back, rump and sides of upper tail-coverts dull white; centre of coverts and tail brown, the latter with white base and tip; sides of breast brown; remainder of lower plumage white.

Distribution. Ceylon, India, Burma, Siam, Cochin China and Malay States.

Nidification. The Black-necked Stork breeds over the whole of its range from October to December, a few birds laying as early as August and others as late as January. The nest is an enormous structure, varying from three to six feet in diameter by one to two feet deep, with a well-made cavity for the eggs. It is constructed of small sticks and branches and well lined with grass or soft rubbish of some kind and is invariably placed by itself on a tree near the top. The tree may be large or small, standing alone in cultivation or one of a group. The eggs number three or four and are like those of other Storks. Thirty eggs measured by myself average only 69·5 × 53·2 mm. but forty-five measured by Hume averaged 73·9 × 53·8 mm. Maxima **74·9** × 53·4 and 70·6 × **55·2** mm.: minima **67·9** × 54·0 and 68·5 × **51·0** mm.

During the breeding-season, sometimes also at other times, both sexes display by dancing before one another with great flapping of wings and clattering of bills.

Habits. Much the same as those of other Storks but it seems to have a predilection for plains in the vicinity of large rivers and it is, perhaps, a more regular fisher than most Storks, though it eats everything else they do. It is nowhere common numerically although so widespread and is never found in flocks.

Genus LEPTOPTILOS.

Leptoptilos Lesson, Traité d'Orn., p. 583 (1831).

Type by taut., *Ardea dubia* Gmelin.

In this genus the bill is very large, high at the base and tapering gradually to the tip; culmen and commissure are both almost straight, the former being about as long as, or a little longer than, the tarsus; the nostrils are small, narrow and placed near the culmen; the head and neck are naked except for a few scattered hair-like feathers, the crown without even these. The genus contains three species, the well-known African Marabout and two Oriental birds, both of which occur in India.

Key to Species.

A. A gular pouch; larger, wing over 750 mm., tarsus over 310 mm.	*L. dubius*, p. 327.
B. No gular pouch; smaller, wing under 700 mm., tarsus under 290 mm.	*L. javanicus*, p. 329.

(2212) Leptoptilos dubius.

THE ADJUTANT.

Ardea dubia Gmelin, Syst. Nat., i, p. 624 (1789) (India).
Leptoptilus dubius. Blanf. & Oates, iv, p. 373.

Vernacular names. *Hargila*, *Garur*, *Peda-dhauk* (Hind.); *Dusta* (Dakhani); *Chaniari Dhauk* (Beng.); *Pinigala-konga* (Tel.); *Don-zat* (Burma).

Description.—Breeding plumage. Head, pouch and neck naked, a few scattered dark brown hair-like feathers on the nape, neck and sides of the head; a ruff of white feathers round the base of the neck; upper plumage, wings and tail black, slightly glossed with green; innermost secondaries and greater wing-coverts silvery-grey; breast, flanks and abdomen white; under tail-coverts soft and feathery, like the Marabout feathers of commerce, but white, not grey.

Colours of soft parts. Iris white or yellowish-white; blue-brown in young birds; bill pale yellowish or greenish-fleshy, more red in the breeding-season near the base; bare skin of head dull reddish-brown, turning to brick-red on the hind-neck and blackish on the fore-crown; pouch and neck yellow, more pink on the pouch and quite fleshy-pink on the end of this, where it is also spotted with black; legs and feet pale greyish-white to pale horny-brown; the pouch can be extended to a great size, looking like a child's pink balloon with smeary black spots.

Measurements. Wing 800 to 820 mm.; tail 310 to 335 mm.; tarsus 320 to 330 mm.; culmen 320 to 345 mm.

In non-breeding dress the secondaries and coverts are like the rest of the wing.

Young birds have far more feathering to the naked parts and have the inner secondaries and coverts dark brown.

Nestling in down pure white.

Distribution. India, Burma, the Indo-Chinese countries, Malay Peninsula to Sumatra, Java and Borneo.

Nidification. The Adjutant breeds during the cold weather, roughly from October to December, most eggs being laid in the latter half of November. There are small colonies in Assam, larger ones in the Sunderbunds and two small colonies in Orissa, whilst it has also been recorded as having bred in Goruckpore. Its real breeding-ground, however, is in South Burma. Here they breed both on the rocks of the Pegu Hills and in the forests, on the former in company with the Lesser Adjutant and on the latter with the Pelicans. On the rocks the colonies are small but in the forests they breed literally in hundreds of thousands, scattered over an area extending through a great part of Pegu on the Ataran River.

The nests are immense structures of sticks and branches with no lining, which are resorted to year after year by the birds until they become filthy in the extreme. The trees selected are the largest in the forest, often Cotton-trees (*Bombax* sp.) without a branch for 50 to 70 feet and almost unclimbable, the nest being placed on one of the lower horizontal boughs. As a rule there is but one nest in each tree, but occasionally two or three, whilst in one of the Orissa colonies there are 14 nests on two great trees, 9 on one and 5 on the other. The eggs number three or four, rarely two only, and are typical Stork's eggs with the close pitted texture and fine surface usual to this family Fifty egg average 77·3 × 57·5 mm.: maxima 82·8 × 61·5 and 80·0 × 64·7 mm.; minima 70·1 × 54·2 and 74·0 × 51·5 mm. It is curious that though this Adjutant is so much larger than the next bird, there is but little difference in the size of their eggs.

Habits. In India the Adjutant is mostly a rainy season visitor but it no longer comes in the vast numbers of fifty years ago. At that time during the rains Adjutants could be seen on the highest points of almost every house in Calcutta, whilst on the open ground and on the racecourse birds stalked solemnly about hunting for offal and odd scraps, hardly deigning to move out of the way of passers-by. These birds came as scavengers and with the advance of municipal sanitary work the Adujtant and the Jackal have had to move farther afield. They are still common in many parts of Eastern Bengal from June to September, whilst in Burma they distribute themselves over the whole country, where it is suitable to their requirements. Their tastes are omnivorous and there are few things an Adjutant will not swallow, whilst they have a curious habit of picking up bright unusual objects, from small pieces of metal to articles the size of a soda-water bottle. On the ground they are very ungainly birds and their love dances are more ludicrous than beautiful, even when accompanied by the normal clattering noise made by Storks. On the wing, however, they are very majestic and a flight of these birds sailing round in great circles is very imposing. They rise on the wing fairly easily but always have to run some distance first. This Stork, although without voice muscles, makes a curious grunting noise the source of which is not known, but which is loud enough to be heard at some distance.

(2213) Leptoptilos javanicus.

THE SMALLER ADJUTANT.

Ciconia javanica Horsf., Trans. Linn. Soc., xiii, p. 188 (1821) (Java).

Leptoptilus javanicus. Blanf. & Oates, iv, p. 374.

Vernacular names. *Chinjara*, *Chandana*, *Chandiari*, *Bang-gor*, *Chota garur* (Hind.); *Madan-chur*, *Modun-tiki* (Beng.); *Tokla-moora* (Assam); *Bor-tokola* (Naogang, Assam); *Dodal-konga*, *Dodal-gatti-gadu* (Tel.); *Mana* (Ceylon); *Don-mi-gwet* (Burma).

Description.—Breeding plumage. Head and neck nearly naked, but with the scattered brown feathers thicker everywhere than in the preceding bird and quite close and feathery on the nape; upper plumage, wings and tail black, glossed with green, closely barred and with a copper spot on the larger secondary coverts near their tips; longest scapulars and innermost secondaries with broad white margins; under wing-coverts black; remainder of lower parts white, the under tail-coverts longer and more fluffy than in the Common Adjutant.

Colours of soft parts. Iris white; bill dull yellow, the tip whitish and base tinged red in the breeding-season; bare skin of crown greenish-brown; face and neck yellow tinged with brick-red in the breeding-season; legs and feet greenish-brown to almost black.

Measurements. Wing 580 to 660 mm.; tail 230 to 253 mm.; tarsus 228 to 268 mm.; culmen 260 to 305 mm.

In non-breeding plumage there are no copper spots on the coverts.

Young birds have more feathering on the naked parts and less gloss on the black upper plumage.

Distribution. Ceylon, Travancore and Malabar, Eastern India to Bengal, Assam and all Burma. Thence it is found East to Western China and South through the Malay Peninsula to Sumatra, Java and Borneo. In Western India it does not occur but Inglis discovered a colony in the Duars.

Nidification. This Adjutant breeds in Ceylon and Travancore from February to May and in North-East India and Burma from November to January. In Pegu it has been found breeding on rocky crags in company with the Greater Adjutant but, as a rule, it breeds in small colonies on trees, sometimes several nests on one tree. The nests are like those of the preceding bird and are used year after year for an immense period of time. A colony discovered by H. A. Hole in Sylhet in 1885 had been known to the hill tribes for as long as they had any traditions. When discovered it had fifteen nests and to-day, in 1929, it still has exactly the same number. When first seen it was in dense virgin forest; now it is surrounded by tea and cultivation but the birds still breed there. The eggs number three or four and the average size of fifty is 76·4 × 55·3 mm.: maxima **86·2** × 58·0 and 75·8 × **62·0** mm.; minima **58·8** × **49·0** mm. If the birds see anyone climbing the trees on which their nests are, they deliberately put their bills through each egg before taking to flight.

Habits. Except that this bird is not nearly so common and does not haunt civilization, its habits are just the same as that of the Common Adjutant. It has the same grunting note, coming from the pit of the stomach, whilst the young birds grunt and hiss loudly when disturbed. The Lesser Adjutant is not a scavenger but will eat any living thing, including chickens, not too big to swallow. Reptiles probably form its staple diet and it hunts marshes and lakes for mud-fish, mollusca, freshwater crabs etc.

Genus IBIS.

Ibis Lacépède, Tabl. Oiseaux, p. 18 (1799).

Type by taut., *Tantalus ibis* Linn.

In this genus the bill is slightly turned downwards throughout its length; it is long, very slightly compressed, broad at the base, with the lower mandible concave beneath and with the culmen rounded throughout; both mandibles subcylindrical anteriorly; the nostrils oval and placed near the culmen at the base of the bill; head and throat naked, nape and neck feathered; legs long, with the tibia half naked; the toes long; under tail-coverts very long, extending beyond the tail.

One species of this genus is found in India.

(2214) Ibis leucocephalus leucocephalus.

THE PAINTED STORK.

Tantalus leucocephalus Pennant, Ind. Zool., p. 11 (1769) (Ceylon).
Pseudotantalus leucocephalus. Blanf. & Oates, iv, p. 376.

Vernacular names. *Janghil*, *Dokh* (Hind.); *Kat-Sarunga*, *Ram-jhankar*, *Sona-janga* (Beng.); *Lungduk* (Sind); *Yerri Kali-konga* (Tel.); *Singa Nareh* (Tam.); *Changa vella nary* (Tam., Ceylon); *Datuduwa* (Cing.); *Hnet-kya* (Burm.).

Description. Primaries, outer secondaries and tail black, glossed with green: lesser and median wing-coverts black with broad white edges; scapulars, greater wing-coverts and innermost secondaries rosy-white, the last with pure white edges and deeper pink than the rest; under wing-coverts and a band across the lower breast black, glossed with green and with white edges to most of the feathers; rest of plumage white.

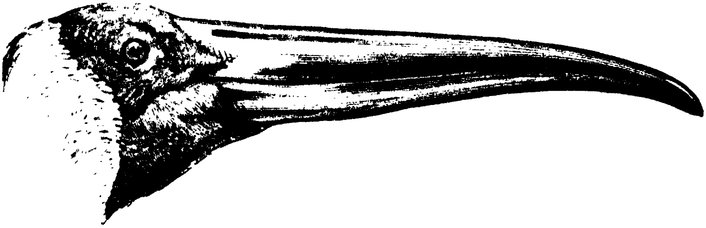

Fig. 57.—Head of *I. l. leucocephalus.* ⅓.

Colours of soft parts. Iris straw-yellow, brown in the young; bill orange-yellow, darker and plumbeous at the base; naked skin of the face orange-yellow; legs and feet brown or fleshy-brown, sometimes nearly red.

Measurements. Wing 490 to 510 mm.; tail 150 to 172 mm.; tarsus 240 to 250 mm.; culmen 252 to 278 mm.

Young birds have the feathers of the neck and back very scale-like, pale brown in colour and with dark edges to those of the neck; lesser and median coverts brown; the greater coverts paler brown; no pectoral band.

Distribution. Ceylon, India, Burma, Indo-China and South-West China. It is common in Sind but is rare in the Punjab, though Whistler obtained it in the Jhelum District in April, June and July and again in the Jhang District in June.

Nidification. The Painted Stork breeds from September to January in large colonies and nearly always in company with numerous other Storks, Herons, Cormorants etc., these, however, generally being rather earlier in starting. The nests are flimsy and ill-made and many are built in the same tree quite close together; there is little or no lining, the eggs being deposited on the twigs of which the body of the nest is composed. Three to five or, rarely, six eggs are laid, which are quite typical of the family. Fifty eggs average 65·9 × 45·0 mm.: maxima **80·2** × **51·6** mm.; minima **65·3** × 46·0 and 65·4 × **43·2** mm.

Habits. The Painted Stork is a very familiar Indian bird, common everywhere where there are marshes, lakes or ponds. It is more exclusively a fish-eater than most Storks and the major part of its diet consists of fish, eels and frogs caught in the water, though it will eat insects, crabs and various other kinds of Stork-food when pressed. It seems to have no note beyond the usual snapping of the mandibles and it soars, flies, dances etc. much like all other members of its family.

Genus **ANASTOMUS**.

Anastomus Bonaterre, Tabl. Encyc. Méth. Orn., i, p. xcii (1790).

Type by mon., *Ardea oscitans* Bodd.

The curious bill of this Stork at once distinguishes it from all others. When adult there is an open space between the mandibles for about two-thirds of their length in the middle; the bill is stout and strong, the gonys is considerably curved and the anterior half of the upper mandible is furnished with lamellæ; the face, chin and throat are naked in adults, feathered all but the lores in juveniles; the tarsus is about equal to the culmen in length and is reticulated throughout; the toes and claws are longer than in other genera of the *Ciconiidæ*. It was formerly supposed that the gap between the mandibles was caused by attrition due to the hard shells of the mollusca upon which this Stork largely feeds but this is now known not to be the case.

(2215) Anastomus oscitans.

The Open-bill.

Ardea oscitans Bodd., Tabl. Pl. Enlum., p. 55 (1783) (Pondicherry).
Anastomus oscitans. Blanf. & Oates, iv, p. 277.

Vernacular names. *Gungla, Ghongal, Ghonghila* (Hind.); *Dokar* (Behar); *Tonte-bhanga, Shamach-banga, Samuk-khol, Hammak-kas* (Beng.); *Pouna konga* (Southern Gonds); *Galu-konga* (Tel.); *Nati-kuti nareh* (Tam.); *Karunary* (Tam., Ceylon); *Gombelle-koka* (Cing.); *Samuk-bhanga* (Assam); *Karu-tsoke* (Burma).

Description.—Breeding plumage. Longest scapulars, primaries and secondaries, bastard wing, primary and secondary coverts and tail black, glossed with purple and dark green; remainder of plumage white.

Colours of soft parts. Iris almost white, grey or pale brown; bill dull greenish-horny, redder beneath; orbital skin and naked lores black; legs and feet dull fleshy.

Fig. 58.—Head of *Anastomus oscitans.* ⅓.

Measurements. Wing 392 to 408 mm.; tail 183 to 217 mm.; tarsus about 140 to 150 mm.; culmen 153 to 162 mm.

In non-breeding plumage the white of the upper parts is replaced with pale smoky-grey.

Young birds have the head, neck and upper breast darker, smoky brown-grey, the feathers of the breast dark-shafted; the mantle is blackish-brown the feathers with pale rufous-grey edges; wing-coverts with dark shafts.

Distribution. The whole of India, Ceylon, Assam, Burma, Siam and Cochin China.

Nidification. The Open-bills seem everywhere to breed principally in July and August, except in Ceylon, where they lay during January, February and March, and in Southern Madras, where Packard took eggs early in December. They associate in colonies of some size, occasionally as large as 400 to 500 pairs, generally keeping aloof from other birds. Sometimes they breed with the Painted Stork and various Herons, but even then seldom build in the same trees with them. The nests are big affairs of sticks, often used for several years, when they become very large, and are placed on trees standing close to, or actually in, the water. One of the large colonies above referred to was in an Assamese village and nine out of ten of the nests were in palm-trees. The destruction during storms was very great but the birds continued to breed, making fresh nests and laying again. The eggs, three to five in number, are broad ovals but little compressed towards the smaller end. Eighty eggs average 57·8 × 41·1 mm.: maxima **64·0** × 40·6 and 52·4 × **43·4** mm.; minima **48·3** × 38·2 and 56·1 × **36·4** mm.

Habits. The Open-bill is perhaps the most common and widely distributed of all our Storks and there are few well-watered districts where it may not be found during the Rains, though it leaves many of the drier during the drought at the end of the Cold Weather. It feeds principally on mollusca, chiefly *Ampullaria*, crushing the shell and then extracting the contents. Land-snails, crabs and the small mollusca it crushes first and then swallows, shell and all. It also eats worms, frogs, lizards, small snakes, insects and fish. The flight is very strong and the birds often spend hours flying high in the air, soaring over their breeding-grounds. They dance like all the Storks and make the same curious clapping noise with their bills whilst they also have a low grunt, which one can only hear when standing very close to them.

Suborder **ARDEÆ.**

This suborder differs from the preceding in having a pair of tracheo-bronchial muscles which control the syrinx and give the possessors vocal powers. The suborder is holorhinal; the mandible is not produced beyond its articulation with the quadrate and there is only a single incision on each side of the posterior border of the sternum; the cervical vertebræ number eighteen or twenty; the ambiens and accessory femoro-caudal muscles are absent and the femoro-caudal generally very small; the spinal feather-tract extends far up the neck, in one genus, *Ixobrychus*, the whole hind-neck being naked.

The suborder contains three well-defined families, of which but one, the *Ardeidæ*, is represented within our area.

Family ARDEIDÆ.

The Herons have the bill long, slender and straight; there are grooves on each side of the upper mandible in which the oval nostrils are placed close to the base; the tarsi are very long, the toes long and slender, with a small web between the middle and outer toes at the base; the hind toe is well developed and placed on the same plane as the anterior toes.

All Herons have powder-down patches on each side of the rump and of the breast and have the middle toe pectinated.

The family has been split up into innumerable genera by some modern systematists but I see no reason to accept more than those accepted by Blanford for our Indian species, though unfortunately several of the names of these genera are untenable and must give place to others.

Blanford's key is simple and easy for the student or field-naturalist and is therefore adopted practically as given by him.

Key to Genera.

A. Tail-feathers twelve.
  a. Nude tibia much longer than inner toe and claw.
    a'. Plumage grey above, varied below.... ARDEA, p. 336.
    b'. Plumage white throughout .... EGRETTA, p. 344.
  b. Nude tibia only slightly longer than inner toe and claw, or actually shorter; plumage either dark grey throughout, or pure white throughout, except on the throat; culmen not exceeding, or just exceeding, tarsus in length .... DEMIEGRETTA, p. 351.

c. Nude tibia shorter than inner toe and claw.
  c'. Wings, body and tail white.
    *a*². Head and back white in Winter, ochreous-buff in breeding-season; culmen shorter than tarsus ...... Bubulcus, p. 349.
    *b*². Head and back always coloured, not buff or only partly so; culmen longer than tarsus .... Ardeola, p. 353.
  d'. Head, body and wings never white.
    *c*². Culmen longer than tarsus .... Butorides, p. 356.
    *d*². Culmen about equal to tarsus, bill deep at base.................... Nycticorax, p. 35
    *e*². Culmen shorter than tarsus........ Gorsakius, p. 361
B. Tail-feathers ten.
  d. Middle toe and claw not longer than culmen.
    e'. Smaller; wing under 160 mm. ...... Ixobrychus, p. 364.
    f'. Larger; wing over 170 mm. .... Dupetor, p. 368.
  e. Middle toe and claw longer than the tarsus, which is longer than the bill .. Botaurus, p. 370.

Genus ARDEA.

Ardea Linn., Syst. Nat., 10th ed., i, p. 143 (1758).

Type by orig. desig., *Ardea cinerea* Linn.

In *Ardea* the bill is long, compressed and pointed, the culmen straight and the edges of both mandibles slightly serrated at the commissure; the upper mandible is grooved on each side, the rather long nostrils being placed near the base; the sides of the head to behind the eye are naked; the tibia is semi-nude; the tarsus long and scutellated in front; the wings are ample but rounded; the tail is short and nearly square; the feathers at the base of the neck and on the scapulars long and attenuated, forming ornamental plumes; head crested; lower plumage very lax and soft.

The genus is cosmopolitan, five species occurring in India. Sharpe placed the Purple Heron in a separate genus, *Phoyx*, on account of its rather larger feet but I follow Blanford and retain it in *Ardea*. In the same way other systematists have placed each of the other species in different genera, none of which seem necessary and are therefore undesirable.

Key to Species.

A. Mid-toe and claw as long as, or longer than, the tarsus; crown and crest black .. *A. purpurea*, p. 337.
B. Mid-toe and claw shorter than tarsus.
  a. Crown of head white in adult; crest black *A. cinerea*, p. 339.
  b. Crown and crest grey in adults.
    a'. Abdomen and flanks grey .... *A. sumatrana*, p. 341.
    b'. Abdomen and flanks white .... *A. imperialis*, p. 342.
  c. Crown and crest chestnut .... *A. goliath*, p. 343.

Ardea purpurea.

Ardea purpurea Linn., Syst. Nat., 12th ed., i, p. 236 (1766) (in Oriente). Founded on Brisson, v, p. 724, pl. xxvi, fig. 2: no locality, but described from a bird in a French Museum. Locality now restricted to France.

The Indian form is said by Sharpe to differ from the typical in having fewer black streaks on the fore-neck and more defined black lines down the sides of the neck. I can see no difference between the two forms in these respects, the differences noted being entirely individual and not geographical. On the other hand, the underparts average darker, as stated, and there is generally more grey in the lanceolate feathers of the breast. There is no difference in the length of the bill as indicated by Sharpe's measurements. I retain this very poor subspecies with a good deal of hesitation.

(2216) Ardea purpurea manillensis.

THE EASTERN PURPLE HERON.

Ardea purpurea var. *manillensis* Meyen, Acta Acad.-Leop. Carol., Suppl., p. 102 (1832) (Philippines).
Ardea manillensis. Blanf. & Oates, iv, p. 381.

Vernacular names. *Nari*, *Lal-sain*, *Lal-anjan* (Hind.): *Khyra* (Behar); *Lal-kank* (Beng.); *Pamula-nari-gadu* (Tel.); *Sannari* (Tam.); *Karawal-koka* (W. Beng.); *Khyung byung* (Arrakan); *Nga-hit* (Burma); *Lal koi* (Assam).

Description. Lores and a streak behind the eye rufous; crown, nape, crest and a line down the hind-neck black; a second line from the gape running up and back to meet the black crest; a third black line down the whole length of the side of the neck; chin and throat white, the rest of the neck and head rufous, with a line of black streaks down the fore-neck: lower hind-neck, back, rump, upper tail-coverts, wings and tail grey, the tail and primaries dark slaty-grey; scapulars with long attenuated tips pale grey with rufous ends; a few long lanceolate very pale grey feathers on the lower hind-neck in old birds; edge of wing all round pale bright rufous; long narrow feathers of base of neck and upper breast bright buff with black streaks and intermixed with grey feathers; a patch of deep rich chestnut on each side of the breast; flanks, axillaries and longest under wing-coverts grey; other under wing-coverts rufous: breast and abdomen mixed chestnut and black; thigh-coverts cinnamon; under tail-coverts black with a little white.

Colours of soft parts. Iris yellow; orbital skin dull greenish or yellowish-green; bill dark yellow, the culmen and tip horny-brown; legs and feet reddish-brown, the soles and hinder edge of the tarsus paler and more yellow.

Measurements. Wing 327 to 387 mm.; tail 120 to 142 mm.; tarsus 121 to 145 mm.; culmen 115 to 144 mm. Males are much larger than females but there are so few sexed specimens in museums that it is difficult to give the limits of measurements.

Young birds have the crown black, changing to chestnut on the nape; chin and throat white; rest of head and neck rufous with numerous blackish streaks down the fore-neck; upper plumage, wing-coverts, scapulars and innermost secondaries dark slaty-grey, with broad margins of rufous to each feather; tail, primaries and outer secondaries dark grey; flanks and axillaries pale grey; lower plumage rufous-buff, the breast with broad dark brown streaks.

Distribution. India, Ceylon, Burma, Indo-Chinese countries to the Philippines and Celebes.

Nidification. The Purple Heron breeds from January to March in Ceylon, from April to July in Saugur (*Blewitt*) and from July to September over the rest of its breeding area in India and Burma, a few birds breeding at the end of June or in early October. Wherever there are swamps and lakes with reedy shores there this Heron will be found breeding, sometimes on the broken-down reeds, sometimes on trees close to, or partly submerged by, water. The favourite site is a bed of dense reeds, some of which the birds trample down to form a platform and then make thereon a rather massive nest of sticks, often lined with a little grass or rush-leaves, occasionally quite unlined. They breed in colonies, sometimes, as found by Oates in Pegu, of many hundreds of pairs, at other times consisting of no more than ten or twenty; again, they may breed all by themselves or in company with many other kinds of birds. The eggs number three to five and are pale sea-green or greenish-blue in colour. One hundred average 54·6 × 39·7 mm.: maxima 66·3 × 41·4 and 61·0 × 46·4 mm.; minima 50·0 × 40·0 and 52·1 × 38·1 mm.

Habits. This Heron is very crepuscular in its habits and feeds principally in the mornings and evenings. It stands quite motionless with head tucked into its shoulders, often on one leg only, watching for a passing fish, which it seizes with a lightning dart of its long neck and bill. Besides fish, frogs, newts, insects and mollusca, all form part of its ordinary fare and any unfortunate young birds which happen to come its way are at once bolted whole. It is not a shy bird as a rule, though it keeps well hidden in the thick reeds and grass but when on trees and quite visible it allows a near approach. It is an intensely curious bird and may be often seen, its long neck stretched up above the reeds, to watch passers-by. Its cry is a loud, harsh croak, uttered as it rises and at night on the wing. It flies with head tucked into its shoulders and long legs sticking out straight behind, progressing at a great pace, though with leisurely flaps of its wings.

Ardea cinerea.

Key to Subspecies.

A. Darker grey above	*A. c. cinerea*, p. 339.
B. Paler grey above	*A. c. rectirostris*, p. 340.

(2217) Ardea cinerea cinerea.

THE COMMON GREY HERON.

Ardea cinerea Linn., Syst. Nat., 10th ed., i, p. 143 (1758) (Sweden); Blanford & Oates, iv, p. 282 (part.).

Vernacular names. *Nari, Sain, Kabud, Anjan* (Hind.): *Khyra* (Behar); *Sada kanka, Anjan* (Beng.); *Saa* (Sind); *Narraina-pachi* (Tel.); *Narayan* (Tam.); *Kalapua-karawal-koka, Indura-koka* (Cing.).

Description.—Male. Centre of crown, chin and face next the bill white, occasionally a black feather or two in the extreme centre and on the forehead; two broad black lines from above the lores running back over the eye to the nape, where they join in the long black crest; mantle, wing-coverts and secondaries ashy-grey, the scapulars long, attenuated and pale grey and the inner secondaries blackish at the tips; tail grey, the central feathers darker and with blackish tips; primaries and outer secondaries, primary coverts and bastard wing almost black; a line down the centre of the fore-neck streaked black and white; remainder of neck white suffused with vinous or smoky-grey; elongate feathers of the breast white, some of the shorter with black streaks; middle of breast, abdomen and under tail-coverts white; a patch of lengthened black plumes on each side of the breast, the black continued down the sides of the abdomen and meeting on the vent; flanks, under wing-coverts and axillaries grey.

Colours of soft parts. Iris golden-yellow; bill yellow in the breeding-plumage with a brown line down the culmen, in Winter nearly all darker brown; loral skin dull yellowish-green; legs and feet greenish-brown, marked with yellowish on the joints and back of the tarsi.

Measurements. Wing 418 to 475 mm.; tail 155 to 185 mm.; tarsus about 135 to 165 mm.; culmen 113 to 128 mm. The female is very little smaller than the male, the measurements greatly overlapping.

The female has the crest and pectoral plumes less developed but does not differ in colour from the male.

Young birds are much browner, darker grey; the neck is nearly all vinous-grey and the forehead and centre of the crown are the same; the lengthened scapulars and breast-plumes are wanting; the fore-neck is more conspicuously streaked with black.

Nestling. Down dark grey above, paler on the sides and whitish below; the down of the crown is very long and erect, with long bristly tips giving a crested appearance.

Distribution. Europe and North Africa to Asia Minor, Palestine and North-West Siberia. A casual straggler only to North-West India in Winter in Sind and Baluchistan.

Nidification. The Common Grey Heron is one of the earliest breeders in Europe, a few eggs being laid as early as February and the majority in March. The birds breed in colonies from a dozen to fifty or more pairs of birds, making large stick nests on trees, or in some places on the Continent in reeds. The eggs are like those of the preceding bird but rather darker and larger, one hundred eggs averaging 60·2 × 43·0 mm.: maxima **68·4** × 43·6 and 61·5 × **49·7** mm.; minima **55·4** × 42·2 and 59·6 × **40·0** mm.

Habits. Very much the same as those of the Purple Heron, though they are never found in such vast colonies. Their food may be said to consist of any living thing small enough to swallow and not wise enough to keep out of their reach, but theoretically their diet is mainly fish and they are often most destructive both to trout and coarse fish. The flight is very powerful, though it appears laboured and in former days the Heron was much prized as quarry for Peregrines in hawking. Its flesh is sometimes eatable, never pleasant and often impossible to eat.

(2218) Ardea cinerea rectirostris.

The Eastern Grey Heron.

Ardea rectirostris Gould, P. Z. S., p. 22 (1843) (New South Wales).
Ardea leucophæa Gould, P. Z. S., 1848, p. 58 (India and China).
Ardea cinerea. Blanf. & Oates, iv, p. 382 (part.).

Vernacular names. As for the preceding bird. *Sardo-koi* (Assam).

Description. Differs from the typical form in being much paler at all seasons of the year.

It is true that Gould differentiated this race on characters that are hardly discernible but he gives a very full description and his name therefore antedates Clark's *jouyi* of China, which consequently becomes a synonym.

Colours of soft parts as in *A. c. cinerea.*

Measurements. Wing (Indian) 422 to 466 mm., (Chinese) 428 to 475 (once 481 mm.); tail 165 to 180 mm.; tarsus 140 to 162 mm.; culmen 109 to 135 mm. The very large series measured show that there is no definite difference in size between the two races.

Nestlings like those of *A. c. cinerea.* These uncouth little things always look as if they had just had a fright, their hair standing on end and their eyes starting out of their heads.

Distribution. Mesopotamia, Persia, all India, Burma and Ceylon. East it extends to China, Hainan, Philippines etc.

Nidification. The Eastern Grey Heron breeds over the greater part of its range in July, August and September but in Ceylon it breeds from December to March, whilst eggs have been taken occasionally in Central India in April, May and June. Unlike the Purple Heron this bird prefers to breed on trees, especially such as Tamarisk, Babool and other trees standing partly in water. These Herons do not nest close together, though several pairs may breed in the same area, for their nests may be found dotted about here and there among colonies of nests of other Herons, Cormorants, Storks etc. The eggs number three or four and are like those of the preceding race. One hundred average 58·6×43·5 mm.: maxima **68·4**×43·1 and 63·1×**46·8** mm.; minima **54·3**×41·6 and 56·4×**39·7** mm.

Habits. The Eastern Grey Heron is not nearly so sociable a bird as either the Purple Heron or its European grey cousin and, as a rule, it will be seen alone or in pairs. It has a habit of sitting absolutely motionless on a tree, on some bare exposed branch, with its beak and neck stretched straight up so that in spite of its size it looks very much like a bulgy, distorted branch. If, however, any one passes close by, curiosity eventually compels it to lower its head to look round. Flight, food, voice etc. are all indistinguishable from those of the European bird.

(2219) Ardea sumatrana sumatrana.

The Dusky-grey Heron.

Ardea sumatrana Raffles, Trans. Linn. Soc., xiii, p 325 (1822) (Sumatra); Blanf. & Oates, iv, p. 383.

Vernacular names. None recorded.

Description. Upper plumage dark slaty-brown, the crown nearly black, the longest crest-feathers tipped white; the whole lower portion of the neck with very long lanceolate feathers white on the inner, grey on the outer, web; some of the longer scapulars coloured the same and others tipped pale grey; tail and primaries slaty-black; feathers of lower plumage long and lax, grey-brown in colour, paler at the tips and with pale or whitish shaft-lines; flanks, axillaries, thighs and under tail-coverts grey; the vent and abdomen with a brown or vinous tinge.

Colours of soft parts. Iris yellow to orange; bill black, the base of the lower mandible pale yellowish; legs and feet black with pale yellow soles.

Measurements. Wing 436 to 480 mm.; tail 151 to 187 mm.; tarsus about 156 to 176 mm.; culmen about 150 to 170 mm.

Young birds. Chin, throat and upper fore-neck whitish; remainder of head and neck dull rufous, the fore-neck mottled with blackish, the sides with faint paler streaks; upper plumage dark brown, each feather edged and tipped pale rufous; quills and tail dark brown; lower surface mottled rufous and brown with pale whitish streaks.

Distribution. Burma from Arrakan, through the Malay Peninsula and Archipelago to Australia.

Nidification. Nothing on record. Mr. T. Archer has obtained eggs of a race of this Heron in Australia apparently breeding in small colonies among reeds in vast swamps but no details have been published and I have seen no eggs.

Habits. This Heron seems to be a coastal bird over most of its range and what little has been recorded of its habits show them to differ but little from those of other large Herons. Within the limits of this work there is one record of its occurrence in "Eastern Bengal," probably Chittagong, as it is found, though rarely, in all the districts at the head of the Bay of Bengal. From these districts it occurs through Arrakan and Western Burma and thence more commonly in the Mergui district of Tenasserim. It is essentially a coastal bird, wandering up the big rivers and estuaries for some distance and very probably breeding in the Mangrove swamps along their shores. It feeds on crabs, mudfish, mollusca etc., which it finds on the mud-flats at low tides.

(2220) Ardea imperialis *.

THE GREAT WHITE-BELLIED HERON.

Ardea imperialis Stuart Baker, Bull. B. O. C., xlix, p. 40 (1928) (Sikkim, Terai).
Ardea insignis. Blanf. & Oates, iv, p. 383.

Vernacular names. None recorded.

Description. Above very like *Ardea s. sumatrana* but a purer, less dark, grey, with the white markings much less conspicuous, more grey, less white; the longest crest-feathers are more grey, less white, at the tips; lower breast, abdomen, flanks, axillaries, under wing-coverts and tail-coverts pure white; thigh-coverts white in front, grey behind.

Colours of soft parts. Iris ochreous-yellow; loral skin, orbital skin and base of lower mandible greenish; bill, upper mandible and inner margin of lower mandible blackish-slaty, tip of lower mandible underneath greenish-ochre, remaining portion mussel-grey; tarsus black with horny patches; claws black (*Stevens*).

Measurements. Wing 546 to 572 mm.; tail 199 to 211 mm.;

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* The name *Ardea insignis* Hodgson, Gray's Zool. Misc., p. 86 (1844) was a *nomen nudum*. It is there cited by Gray as a synonym of *nobilis* Blyth and therefore cannot be resuscitated by Hume for the present bird.

tarsus 171 to 216 mm.; culmen 152 to 176 mm. There are, unfortunately, no sexed specimens available for measurement.

Young birds are dark brown above, the head and neck pale rufous-brown, streaked with whitish; bill pale horny-brown.

Distribution. The Sikkim and Bhutan Terai to Assam and Northern Burma.

Nidification. Very little known. Eggs were sent to me from Sikkim said to have been of this bird; one addled egg was taken from two nests which contained two chicks each as well. These are very small and there may have been some mistake about them. Mr. W. S. Thorn found one nest of this species on the Temru River, Arrakan, in April, a huge nest of sticks placed high up in a tall tree. It contained four eggs which only differ from those of *A. cinerea* in their great size. In colour they are rather a pale washed-out sea-green, probably due to the fact that they were on the point of hatching. Two of these eggs measure 72·0 × 50·8 and 69·2 × 49·9 mm.

Habits. This fine Heron is an inhabitant of the swamps at the foot-hills of the Terai, or lower Himalayas, from Sikkim to Arrakan and ascends the hills to some five thousand feet and, possibly, a great deal higher. In Assam it was not very rare but haunted most inaccessible swamps and forests where there were no tracks and only difficult waterways. It certainly breeds in Sadiya, where a female I shot had large, soft-shelled eggs, one already in the oviduct, and it occurs there all along the foot-hills, either singly or in small flocks of four or five birds. Stevens met with it several times in the Winter on the streams debouching from the hills in North Lakhimpur, where it was always solitary and very wild and wary. The only stomach I have examined contained nothing but crayfish, one of these measuring fully eight inches. It has a very loud, deep croak and flies very fast, though with a deliberate slow flapping like that of other Herons.

(2221) Ardea goliath.

THE GIANT HERON.

Ardea goliath Cretzchm., Rüpp. Atlas, p. 39, pl. 36 (1826) (Africa); Blanford & Oates, iv, p. 384.

Vernacular names. None recorded.

Description. Crown and crest deep chestnut; chin, throat and fore-neck white; hind-neck, sides of head and neck pale vinous-rufous; a line of black down the centre of the lower fore-neck; upper plumage dark grey, the long, narrow scapulars and inner scapulars rather paler; primaries, outer secondaries and tail blackish-brown; lanceolate feathers of fore-neck and upper breast white with some heavy black streaking in the centre; whole lower plumage deep rufous.

Colours of soft parts. Iris yellow, with an outer rim of red; bill dark horny-slaty, the lower mandible, gape and commissure paler and yellowish; legs and feet dark slaty-black.

Measurements. Wing, ♂ 570 to 589 mm., ♀ 592 to 622 mm.; tail 212 to 237 mm.; tarsus 225 to 252 mm.; culmen, ♂ 184 to 196 mm., ♀ 180 to 190 mm.

Young birds have the neck dull rufous with blackish streaks down the centre of the fore-neck; chin and throat white, streaked with pale dull brownish-rufous; upper parts brown with rufous edges to each feather; primaries, outer secondaries and tail blackish-brown; underparts pale rufous with white shaft-streaks, wider on the abdomen and posterior flanks.

Distribution. Africa. In India this Heron occurs casually from time to time, but is probably often overlooked. Blyth in 1885–6 obtained several immature specimens in the Calcutta Bazaar; two were shot by Parker in Ceylon in 1878–9 and a third was seen in 1880; Jerdon saw them at the foot of the Khasia Hills, where I also saw them in 1909; Hume probably saw some birds in Sind and Blanford twice saw Herons, presumably of this species, once in Nagpur and once at Bampur in Baluchistan. Faucus obtained an adult specimen in the Sunderbunds which cannot be distinguished in any way from African birds and observes that this Heron is not uncommon there. I saw five birds of this species in Dacca in 1910 on a sand-bank on the Megna but they were very wild and would not allow an approach within gunshot.

Nidification. This magnificent Heron breeds in September in Africa, eggs having been taken in that month by Horsbrugh on the Modder River, Cox on Laila, off the Somali coast and by Herbert in Abyssinia. The nests are said to be great masses of sticks on trees overhanging rivers or upon heaps of débris in the river-beds. The eggs are three or four in number, the usual sea-green in colour, ten of them averaging 73·5 × 52·5 mm.: maxima **75·4** × 52·1 and 72·5 × **54 0** mm.; minima **68·2** × **52·0** mm.

Habits. This is said to be a very shy bird, very difficult to approach within shot, though in the Sunderbunds Faucus did not find this to be the case. In other respects its habits are typical of the genus.

Genus **EGRETTA**.

Egretta Forster, Synop. Cat. B. Birds, p. 59 (1817).

Type by mon., *Egretta garzetta*.

The genus *Egretta* contains those Egrets which are white at all seasons but which during the breeding-season develop ornamental plumes from the back as well as in some cases from the breast and head. They are smaller than the birds of the genus *Ardea* and have much more slender bills and even thinner necks. In Winter plumage the various species can only be distinguished by size.

Key to Species.

A. Neither crest nor breast-plumes; wing over 350 mm.; tarsus over 160 mm.	*E. alba*, p. 345.
B. No crest but full breast-plumes; wing between 300 and 350 mm.; tarsus under 150 mm	*E. intermedia*, p. 347.
C. Both crest and breast-plumes: wing under 300 mm.; tarsus under 110 mm.........	*E. garzetta*, p. 348.

Egretta alba.

Key to Subspecies.

A. Decidedly larger, wing 410 to 470 mm. ..	*E. a. alba*, p. 345.
B. Smaller, wing 354 to 391 mm.	*E. a. modesta*, p. 346.

(2222) Egretta alba alba.

THE LARGE EGRET.

Ardea alba Linn., Syst. Nat., 10th ed., i, p. 144 (1758) (Europe).
Herodias alba. Blanf. & Oates, iv, p. 385 (part.).

Vernacular names. *Mallang-bogla*, *Torra-bogla*, *Tar-bogla*, *Bara-bogla* (Hind.); *Dhar bogla* (Beng.); *Pedda-tella-konga* (Tel.); *Mala-konga* (Gond); *Vella-koku* (Tam., Ceylon); *Badda-tel-koka* (Cing.).

Description.—Breeding plumage. Whole plumage pure white; from the interscapulars and scapulars grow three sets of long plumes extending some inches beyond the tail; these plumes have shafts stout at the base and gradually tapering to very fine at the tip and are furnished with barbs which are fine and separated.

Colours of soft parts. Iris yellow; bill black; orbital skin to behind the eye, naked lores and edge of gape bright green; legs and feet black.

Measurements. Wing 410 to 470 mm.; occasionally up to 510 mm.; tail 175 to 200 mm.; tarsus about 165 to 215 mm.; culmen 116 to 142 mm.

In non-breeding plumage the dorsal plumes are dropped; the bill is yellow; the naked skin of the face duller and yellowish and the tibia tinged with livid or greenish.

Nestling. Down all pure white; head down long but not bristly as in the young of the genus *Ardea*.

Distribution. Breeding South-East Europe to South-East Siberia, Northern China and Japan. In Winter South to North Africa, India and China. In India it is a rare visitor but occurs scattered throughout the North as far East as the United Provinces.

Nidification. In Europe these Egrets breed from April to June in colonies of considerable size, building their stick nests both on trees and on beaten-down reeds. They lay from three to four eggs, occasionally five, of the usual type but varying more in depth of colour than do the eggs of most Herons. The average of 100 eggs (80 Jourdain) is 60·3 × 42·4 mm.: maxima **68·4** × 44·7 and 61·0 × **45·6** mm.; minima **53·9** × 42·5 and 61·3 × **40·0** mm.

Habits. The Large Egret is a rather solitary bird except in the breeding-season. It feeds principally on fish, frogs, tadpoles and freshwater mollusca etc. but, like most Herons, will also devour young and sickly birds, mice etc. and it also feeds constantly on grasshoppers, coleoptera etc. Its note is a low croak and, when disturbed, it utters a louder, harsher cry. The flight of all the Egrets is typical of that of the Herons but they are slower than the birds of the genus *Ardea*, yet flap their wings rather more quickly.

(2223) Egretta alba modesta.

THE EASTERN LARGE EGRET.

Ardea modesta Gray, Zool. Misc., p. 19 (1831) (India).
Herodias alba. Blanf. & Oates, iv, p. 385 (part.).

Vernacular names. The same as for the preceding race. *Bor bog* (Assam).

Description. Only differs from the typical form in being much smaller.

Colours of soft parts the same as in the European bird.

Measurements. Wing 354 to 391 mm.; culmen 104 to 116 mm. and much more slender than in *E. a. alba*.

Distribution. All India, Ceylon, Burma and East through the Malay Archipelago to Australia.

Nidification. This beautiful Egret breeds from November to March in Ceylon and Southern India and from July to September in Northern India, though when there are early rains a few birds begin to breed during the end of May in Assam. They breed in small colonies with other Herons and Cormorants etc., sometimes having their nests in little clusters together but more often dotting them about here and there among the other breeding birds. The nests are rough platforms of sticks, sometimes lined with rushes, sometimes not, whilst the eggs number three or four and only differ from those of the European Large Egret in being smaller. Forty eggs average 54·0 × 38·6 mm.: maxima **60·5** × 39·3 and 58·1 × **40·6** mm.; minima **48·5** × 37·2 and 55·0 × **36·8** mm.

Habits. The Large Egret is less common than the smaller species and more solitary in its habits, otherwise it differs but little from the other species of the genus.

(2224) Egretta intermedia intermedia.

THE INDIAN SMALLER EGRET.

Ardea intermedia Wagler, Isis, 1829, p. 659 (Java).
Herodias intermedia. Blanf. & Oates, iv, p. 386.

Vernacular names. *Patangkha-bogla*, *Patokha-bogla*, *Karchia-bogla* (Hind.).

Description.—Breeding plumage. Pure white; from the interscapulars springs a long train of feathers similar to the ornamental plumes of the Large Egret but much longer in proportion; the base of the fore-neck and upper breast are also decorated with the same kind of feathers, though much shorter.

Colours of soft parts. Iris yellow; naked skin of face green; bill, legs and feet black.

Measurements. Wing 304 to 333 mm., once 354 mm.; tail 116 to 135 mm.; tarsus about 114 (once), 122 to 148 mm.; culmen about 68 (twice), 73 to 97 mm., once 118 mm.

In non-breeding plumage the ornamental plumes are shed.

Colours of soft parts. Bill yellow, darker at the tip and rather more brown at the base; bare skin of face yellowish; legs and feet dusky black, greenish at the joints and on the tibia.

Distribution. Throughout Ceylon, India, Burma, South to Malay Peninsula, Indo-Chinese countries to China, Japan and the Philippines.

Nidification. The Smaller Egrets breed in Ceylon from November to March, occasionally on to April and May; in Madras and the South they breed during December and January, whilst in Northern India, Assam and Burma they breed from July to September. In very wet years the birds breed earlier and I have seen eggs in May. These Egrets breed in very large colonies, sometimes of several hundreds and though they occasionally build their nests in among those of other Herons, Storks and Ibises, as a rule they keep a little apart from them. The nests are of the usual type and the normal full complement of eggs is four, rarely three or five. Very pale eggs occur, about one in every twenty clutches, but the average colour is a trifle darker than in *A. alba*. In size sixty eggs average 47·6 × 35·8 mm.: maxima **52·8** × 36·1 and 50·1 × **38·6** mm.; minima **42·6** × 35·0 and 48·0 × **33·1** mm.

Habits. Those of the genus but this species seems exceptionally sociable, assembling in very large flocks. They feed very much on insects, especially on coleoptera and grasshoppers and may be seen sometimes feeding with Cattle Egrets among cattle. They are very easy birds to tame and can be allowed absolute liberty in gardens and orchards without fear of their flying away. Even in the breeding-season they will breed close to their home and visit their owners mornings and evenings for food and notice. These Herons are kept by villagers in large heronries for the sake of their plumes, whilst villages which have heronries of wild birds in their villages or in their close vicinity protect them very zealously from outsiders.

(2225) Egretta garzetta garzetta.

THE LITTLE EGRET

Ardea garzetta Linn., Syst. Nat., 12th ed., i, p. 237 (1766) (in Oriente).
Herodias garzetta. Blanf. & Oates, iv, p. 387.

Vernacular names. *Kilchia* or *Karchia bogla* (Hind.); *Nella nucha konga* (Tel.); *Suda-koka* (Cing.); *Tetur-bog* (Assam); *Vellai-koka* (Tam. in Ceylon).

Description.—Breeding plumage. Pure white; there is a crest composed of two very long attenuated but not decomposed feathers and other similar feathers from the base of the fore-neck overhang the breast; a thick bunch of decomposed dorsal plumes extends beyond the tail.

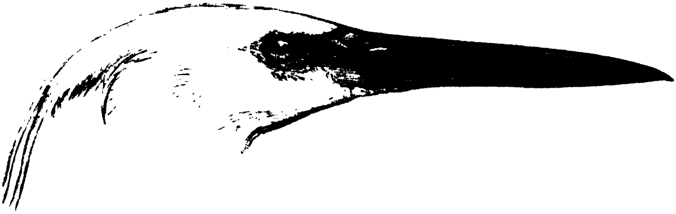

Fig. 59.—Head of *E. g. garzetta.* ½.

Colours of soft parts. Iris yellow; facial skin greenish-yellow; bill black, the gape and base of lower mandible yellowish; tarsus and tibia black; toes mixed yellow and black, the soles almost all yellow.

Measurements. Wing 257 to 289 mm.; tail 92 to 108 mm.; tarsus 99 to 110 mm.; culmen 79 to 91 mm.

In non-breeding plumage the ornamental plumes are dropped, though occasionally some of the pectoral plumes are retained.

Colours of soft parts as in Summer.

Distribution. Breeding in South Europe from Spain to South Russia; Africa from Algeria to South Africa and Madagascar and throughout Asia to China and Japan. It is common throughout Ceylon, India and Burma.

Nidification. The Little Egret breeds all over India and Burma in the months July to September, except in the extreme South and in Ceylon, where most birds lay from March to May or earlier. As with other Herons, so these birds also breed in mixed colonies on semi-submerged trees or on those beside lakes and ponds, often in the very centre of a village, showing not the slightest fear of the people and animals all round them. The nests are collections of sticks very badly matted together and, generally, with no special lining. They are used year after year and, I think, as a rule, the same pair of birds occupy the same nest, though this is not always the case, as I have found Pond-Herons occupying old nests of Little Egrets and *vice versâ*. The nests, which are roughly repaired and added to, in time become very large and untidy, very dirty and extremely verminous. The Little Egrets seem very partial to breeding on trees round tanks in villages and have a decidedly unsanitary effect on the water, in spite of which the villagers protect them very zealously. The birds lay three to five eggs of the usual rather deep sea-green colour, sixty of which average 44·4 × 31·7 mm.: maxima **49·0** × 32·0 and 44·0 × **34·1** mm.; minima **40·3** × 31·9 and 43·7 × **30·8** mm.

Habits. This familiar little Egret is very common all over India, having the habits of the genus and constantly frequenting village ponds, small lakes and the greater swamps and jheels. It feeds more on insects than the larger species but small reptiles—frogs etc.—form its staple diet.

Genus BUBULCUS.

Bubulcus Bonaparte, Comp. Rend., xl, p. 722 (1855).

Type by taut., *Ardea ibis* Linn.

This genus is distinguished from *Egretta* by its shorter bill and feet, whilst the nude portion of the tibia is shorter than the inner toe without claw. The changes in the plumage in the breeding-season are also different, buff hair-like plumes appearing on the the head and back.

One species only is known inhabiting the warmer parts of Europe and Asia and all Africa.

Bubulcus ibis.

Ardea ibis Linn., Syst. Nat., 10th ed., i, p. 144 (1758).

Type-locality: Egypt.

The typical form differs from that which occurs in India in having the decorative plumes strongly tinged with pinkish and in having a rather shorter bill.

(2226) Bubulcus ibis coromandus.

THE CATTLE EGRET.

Cancroma coromanda Bodd., Tabl. Pl. Enlum., p. 54 (1783) (Coromandel).
Bubulcus coromondus. Blanf. & Oates, iv, p. 389.

Vernacular names. *Surkhia-bogla*, *Badani-bogla*, *Doria-bogla* (Hind.); *Gai-bogla* (Hind. and Beng.); *Samti-tonga* (Tel.) *Huni-*

koka (Tam., Ceylon); *Gehri-koka*, *Harak-kokha* (Cing.); *Gobogali* (Assam).

Description.—Breeding plumage. Feathers of head and neck very long and decomposed, orange-buff; a long tuft of dorsal plumes from the interscapulars orange-buff, reaching to the end of the tail or a little beyond it; remainder of plumage pure white.

Colours of soft parts. Iris golden-yellow; bill yellow; orbital and facial bare skin greenish-yellow; tarsi and feet black; the upper part of the tibia and soles yellow or greenish-yellow.

Measurements. Wing 240 to 260 mm.; tail 83 to 96 mm.; tarsus 82 to 92 mm.; culmen 50 to 66 mm.; males average a little larger than females, but the extremes are almost identical.

In non-breeding-plumage the orange feathers are shed and the whole plumage is pure white. The colours of the bill, legs etc. do not change.

Distribution. All India, Ceylon, Burma, the Malay Peninsula, Siam and the islands to the Philippines, Moluccas and Korea.

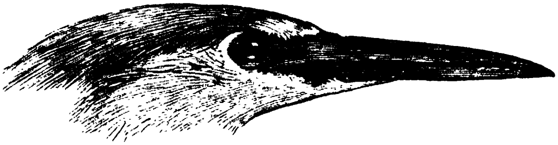

Fig. 60.—Head of *B. i. coromandus*. ½.

Nidification. The Egret breeds at the same times as the other species of Egret, *i. e.* from July to the end of the Rains in Northern India, Assam and Burma, in December to March in Southern India whilst in Ceylon it breeds from January to May. Like all the family it breeds in large colonies with other Herons, Egrets, Cormorants etc., building the usual untidy stick nest and laying three to five eggs, which are decidedly a paler skim-milk blue than those of any of the other Indian Herons and Egrets. In shape also they are rather broader ovals. Eighty eggs average 44·1 × 33·6 mm.: maxima 48·5 × 32·0 and 45·1 × 35·1 mm.; minima 41·4 × 33·8 and 43·5 × 32·0 mm.

Habits. This Egret differs from the other members of the family in being almost entirely an insect-eater, spending most of its time wandering about cattle pastures, feeding on the insects and grasshoppers which the latter disturb and also picking off ticks from the backs of cattle. The birds, of course, also eat frogs, worms, fish and mollusca as well. They are extraordinarily tame, allowing people to pass within a few feet without moving and then merely flapping lazily away or stalking solemnly off for a few yards before recommencing to feed. Their voice is a low, deep croak, seldom uttered and the young birds hiss loudly when handled in the nest.

Genus DEMIEGRETTA.

Demiegretta Blyth, Jour. A. S. Beng., xv, p. 372 (1846).

Type by mon., *Demiegretta concolor* = *D. sacra* Gmelin.

Demiegretta differs from *Egretta* in having the train composed of lanceolate feathers, shorter than the disintegrated plumes of that genus. The breast-plumes also are lanceolate and are worn all the year round and not in the breeding-season only; the nude portion of the tibia is less in extent.

In colour the Reef-Herons are dimorphic, being either all grey or all white, though intermediate piebald birds are common. The colour-phases are not yet understood. It does not seem to depend on sex or age, as many birds breed in all three phases of plumage, whilst in some cases a grey bird mates with a white, though generally the colours mate together. In one case certain young white birds moulted into grey plumage in the eighth month and there are specimens in the British Museum which seem to be in course of assuming a grey from a white plumage.

The genus is represented on the sea-coasts of Africa, Arabia, India, the islands of Southern Asia to Australia and the Pacific Islands. Two species are found in India.

Key to Species.

A. Crest of thick, rather hairy feathers; a white streak only on centre of throat in grey birds. *D. sacra*, p. 351.
B. Crest of two long feathers; whole chin and throat white in grey birds .... *D. asha*, p. 353.

(2227) Demiegretta sacra sacra.

THE EASTERN REEF-HERON.

Ardea sacra Gmelin, Syst. Nat., i, p. 640 (1788) (Tahiti).
Lepterodius sacer. Blanf. & Oates, iv, p. 391.

Vernacular names. None recorded.

Description. Two phases. One pure white, the other dark slaty-black, the chin generally white; the abdomen browner and paler than the back. The feathers of the lower fore-neck, overhanging the breast, are long and lanceolate; there is a crest of short, thick feathers and there are long lanceolate plumes on the scapulars and interscapulars, the ends of a paler slaty-grey than the rest of the plumage.

Pied birds in every intermediate state of plumage may be found but these are generally young and adults are nearly always either pure white or all slaty.

Colours of soft parts. Iris yellow; bill horny-brown above, yellowish at the base and on lower culmen, often yellow all over in white birds; legs varying from pale yellowish-green in white birds to deep dull greenish or nearly black in the dark individuals.

Measurements. Wing 250 to 293 mm.; tail 93 to 98 mm.; tarsus 72 to 77 mm; culmen 70 to 86 mm.

Distribution. Andamans, Nicobars, coasts of Burma, the Malay Peninsula and Archipelago to Australia.

Nidification. Hopwood found this Heron breeding in Oyster Island, off the Arrakan coast, in May but in the Andamans, Nicobars and islands off the Malay coast the usual breeding-time is from the end of June to July. A few birds breed during the last week in May but, on the other hand, many do not lay until August or even September. They breed in colonies, making their nests on the Mangrove swamps along the shores, often placing them within a few inches of the water at high tide, whilst they seldom place them more than six feet above it. The nests are typical Herons' nests but all those taken in the Andamans and Nicobars were close to the sea. On Oyster Island Hopwood also found them breeding on scrub near the edge of the island but Shopland took nests from a patch of thorny jungle in the middle of the island, whilst Davison was told that on Trinkut Island the birds built on coco-nut palms. The eggs, most often three in number but occasionally four or even five, are pale sea-green or blue-green in colour, paler than most Herons' eggs but not quite so pale as those of the genus *Bubulcus*. Fifty eggs average 44·8 × 33·3 mm.: maxima **48·1** × 32·2 and 44·4 × **34·1** mm.; minima **42·5** × 31·8 and 47·5 × **31·7** mm.

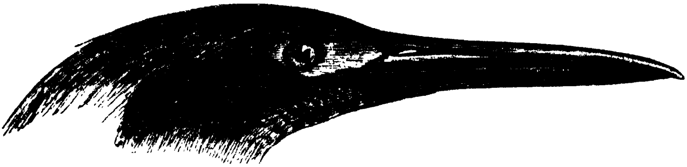

Fig. 61.—Head of *D. sacra*. ½.

Habits. The Reef-Herons are purely coastal birds and, except when breeding, very solitary, quiet birds, sitting hunched up on some mangrove root, almost invisible in the shadows. They feed on small mud-fish, crustacea and mollusca, which they find in quantity in all the muddy shores they frequent. They fly with the usual deliberate wing motion of the Herons, yet are capable of considerable speed when frightened. They are very crepuscular in their habits.

(2228) Demiegretta asha.

The Indian Reef-Heron.

Ardea asha Sykes, P. Z. S., 1832, p. 157 (Deccan).
Lepterodius asha. Blanf. & Oates, iv, p. 390.

Vernacular names. *Kala Bogla* (Hind.).

Description. Two phases as in the preceding bird, one white, the other slaty-grey with more of a blue-grey tinge than in *D. sacra*; the white of the chin extends to the whole of the throat and sometimes runs down the fore-neck for a couple of inches.

In breeding plumage the two long lanceolate crest-plumes distinguish this bird at a glance from the bushy-crested *D. sacra.*

Colours of soft parts as in the Eastern Reef-Heron.

Measurements. Wing 267 to 301 mm.; tail 102 to 112 mm.; tarsus 97 to 102 mm.; culmen 94 to 101 mm.

In non-breeding plumage the ornamental plumes are all shed.

Distribution. Shores of the Persian Gulf to Ceylon and the Laccadives.

Nidification. The Indian Reef-Heron is said to breed in Ceylon and certainly does so in the Laccadives and all along the Western coast of India, North to the extreme head of the Persian Gulf, both on the mainland and on islands in the Gulf. In the centre of Karachi city there is a large colony breeding on a few Pepul-trees round a tank which has been there for a very long time. In 1989 Bulkley was told that the colony was centuries old and in 1927 the birds and their nests were still there. The nests are made of leafy branches and twigs, lined with leaves and are placed high up in big trees, low down on mangrove-trees and bushes by creeks or actually on the ground in the islands where there is no bush- or tree-growth. The eggs number three or four and are like those of the preceding bird but decidedly darker in colour. Fifty eggs average 44·9×34·3 mm.: maxima **49·7**×34·0 and 46·0×**36·0** mm.; minima **43·8**×32·8 and 44·9×**32·3** mm. In Ceylon Layard records this Reef-Heron as breeding in May and June. In Sind it breeds in March and April, whilst on the Mekran and Persian Gulf coasts it breeds in April and May.

Habits. Similar to those of the Eastern Reef-Heron and, like that bird, restricted to the coast and islands, though storm-driven individuals may be met with occasionally inland.

Genus ARDEOLA.

Ardeola Boie, Isis, 1822, col. 559.

Type by mon., *Ardea ralloides* Scop.

The Pond-Herons, or Squacco Herons as they are called in England, are intermediate in plumage between the Egrets and Herons but are smaller than either. The feathers of the head, neck and upper breast are elongate and those of the two latter decomposed in the breeding-season, during which there is also a crest of elongate, lanceolate feathers. The bill is stout and about equal in length to the middle toe and claw; the tarsus is strong and about the same in length as the bill: the tail has twelve feathers and is typically broad; the neck is shorter than in the Herons.

The head, neck and back are always coloured but undergo a complete change of colour in the breeding-season.

The genus is represented almost throughout the temperate and tropical countries of the Old World.

Key to Species.

A. Head and neck in breeding plumage brown.... *A. grayii*, p. 354.
B. Head and neck in breeding plumage chestnut .. *A. bacchus*, p. 355.

(2229) Ardeola grayii.

The Indian Pond-Heron.

Ardea grayii Sykes, P. Z. S., 1832, p. 157 (Deccan).
Ardeola grayii. Blanf. & Oates, iv, p. 393.

Vernacular names. *Bogla*, *Andha-bogla*, *Chama-bogla*, *Khunch-bogla* (Hind. and Beng.); *Ral-puchake* (Gond); *Kokku* (Tam.); *Gudi-konga* (Tel.); *Kana-koka* (Cing.); *Hbyein-ouk* (Burm.).

Description.—Breeding plumage. Chin, throat and fore-neck white; long white occipital crest; remainder of head and neck light yellowish-brown; feathers of back and scapulars decomposed, very long and rich maroon in colour, extending over the tail and inner secondaries; wings white, the innermost secondaries and outermost scapulars buff; lower back, rump, upper tail-coverts and tail white; long lanceolate feathers of breast and upper flanks ashy-brown with long yellow streaks; lower flanks, abdomen, axillaries, under tail- and under wing-coverts white.

Colours of soft parts. Iris bright pale yellow; bill black at the tip, horny-brown over the nostrils, bluish at the base, yellow elsewhere; legs and feet dull green, greenish-yellow or horny-green.

Measurements. Wing 199 to 230 mm.; tail 73 to 84 mm.; tarsus 60 to 64 mm.; culmen 60 to 67 mm.

In non-breeding plumage the head and neck are blackish, streaked with buff, the buff predominating on the sides of the head and neck; chin, throat and fore-neck white; mantle brown, the scapulars streaked with white; lower back, rump and tail white; wings white, the innermost secondaries brown and the short scapulars next them white; sides of upper breast white in the centre, yellow-buff at the sides streaked with dark brown; a maroon patch on each side of the lower breast; remaining under-plumage white.

Distribution. All India, Ceylon and Burma, East to Siam, South-East to Malay States, North-West to the Persian Gulf and occurring in the Andamans, Nicobars and Laccadives.

Nidification. Wherever there is any water, pond, village tank or swamp the Pond-Heron may be found breeding in colonies, generally in company with other Herons, Egrets, Cormorants etc. Often it nests round tanks in the middle of big villages and twenty years ago it actually bred in Calcutta and possibly still does so. Most nests are built on trees, such as Mango, Tamarind, Pepul etc. at some height from the ground; sometimes clumps of bamboo are employed as nesting-sites and, very rarely, beds of reeds. The nests are rough collections of twigs and sticks with no lining; the eggs number three to five and are in colour a pale green-blue, decidedly darker than the eggs of the Cattle Egret. Eighty-five eggs average 38·0×28·5 mm.: maxima **40·3**×29·6 and 39·3×**31·0** mm.; minima **34·3**×27·1 and 35·1×**27·0** mm.

The breeding-season is December to March in Southern India and June to August in Northern India and Burma.

Habits. This little Heron is one of the most common and best known of birds all over India, for any ditch or small and dirty pond will suffice to produce a meal for it. When waiting for its food, frogs, crabs, mud-fish etc., it sits hunched up, a dowdy, patient little figure not easy to spot against a dark background but when it rises and spreads its wings it at once becomes an almost white bird, conspicuous at any distance. In addition to its fish and reptile diet, it eats all kinds of large insects as well as worms, grubs and termites. It is a silent bird but invariably utters a low, hoarse croak as it rises, whilst at night, when the colonies settle down to roost, there is a considerable amount of querulous croaking and fluttering.

(2230) Ardeola bacchus.

THE CHINESE POND-HERON.

Buphus bacchus Bonaparte, Consp. Av., ii, p. 127 (1855) (Malacca).
Ardeola baccha. Blanf. & Oates, iv, p. 398.

Vernacular names. *Hbyein-ouk* (Burma).

Description.—Breeding plumage. Chin and throat white; rest of head and neck with long crest dark chestnut; back and inner scapulary plumes black, the longer tinged with slaty; lanceolate breast-plumes chestnut, the longest tipped slaty-black; remainder of plumage white, the first few primaries pale mottly brown on the outer webs and tips.

Colours of soft parts. Iris deep golden-yellow; bill yellow, blackish on the terminal quarter, bluish at the base; orbital skin greenish-yellow; legs and feet yellowish-green, the soles still paler.

Measurements. Wing 195 to 238 mm.; tail 72 to 90 mm.; tarsus 60 to 64 mm.; culmen 61 to 69 mm.

In non-breeding plumage like *A. grayii*, rather more brown and buff on the head and neck and rather deeper brown on the back and scapulars.

Distribution. From Eastern Assam, Manipur, Burma and the Malay Peninsula to China and Japan and through the Malay Archipelago to Borneo. It is also found in the Andamans.

Nidification. Very similar to that of the preceding bird, with which it is sometimes found breeding in Eastern Assam and Burma. The eggs are not distinguishable from those of that bird. Fifty eggs average 37·7 × 28·4 mm.: maxima **39·2** × 28·8 and 38·2 × **30·1** mm.; minima **34·0** × **26·7** mm.

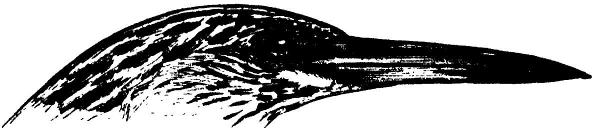

Fig. 62.—Head of *A. bacchus* (winter plumage). ½.

In Assam the breeding-season is from the end of June to August; in China Vaughan and Jones found it laying during May.

Habits. Exactly the same as those of the preceding bird.

Genus BUTORIDES.

Butorides Blyth, Cat. Birds Mus. As. Soc. Beng., p. 281 (1852).

Type by mon., *Butorides javanica* Horsf. & Moore.

In the genus *Butorides* there is no nuptial plumage; the tibia is feathered nearly to the joint; the tarsus is comparatively much shorter than in the preceding genera and the feet are smaller and more slender; the middle toe and claw are about equal to the tarsus but much shorter than the culmen; the head is furnished with a crest; the scapulars and interscapulars are long and lanceolate but not disintegrated; there are twelve tail-feathers.

The genus extends through Asia, Africa and America, one species only being represented in India.

Butorides striatus.

Ardea striata Linn., Syst. Nat., 10th ed., i, p. 238 (1758) (Surinam).

Differs from the Indian form in having the fore-neck and upper breast strongly marked with rufous. A few Malayan birds show a faint trace of this rufous, but for which I should have given our bird *javanica* full specific status.

Key to Subspecies.

A. Lower plumage paler, more grey, less slaty	*B. s. javanicus*, p. 357.
B. Lower plumage darker and more slaty-grey	*B. s. spodiogaster*, p. 359.

(2231) Butorides striatus javanicus.

The Indian Little Green Heron.

Ardea javanica Horsf., Trans. Linn. Soc., xiii, p. 190 (1821) (Java).
Butorides javanica. Blanf. & Oates, iv, p. 395 (part.).

Vernacular names. *Kancha Bogla* (Hind.); *Kana bogla* (Beng.); *Ungus Fa-o-nang* (Lepcha); *Dosi-honga* (Tel.); *Doshi koku* (Tam.).

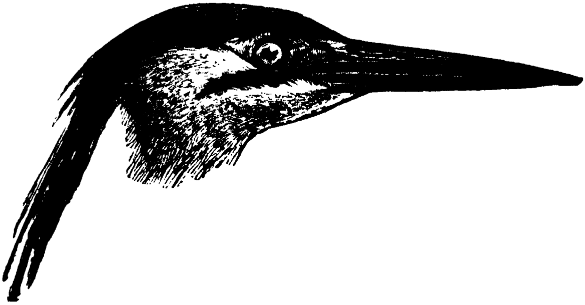

Fig. 63.—Head of *B. s. javanica*. ½.

Description. Forehead, crown, a streak under the eye and long occipital crest black glossed with green; region between eye-streak and crown white; chin and centre of throat white, cheeks white; remainder of head and neck grey, the centre of the foreneck white marked with grey and browny-grey; long scapulars and interscapulars grey glossed with bronze-green and the outer feathers all bronze-green; rump blackish-grey, bronze-tinted; upper tail-coverts and tail blackish-grey, glossed externally with green and the tail-feathers white-shafted and with purer grey centres; wing-coverts dark glossy green, each feather narrowly edged with white; primaries black, the outer webs suffused with green and greyish at the tips; secondaries greener and edged with white; lower parts pale grey, the white bases to the feathers shining through everywhere; under tail-coverts white with blackish tips or edges.

Colours of soft parts. Iris yellow; bill black, the edge of the lower mandible yellowish, the yellow more in extent in non-breeding birds; legs and feet dull green or plumbeous-green, the soles dull orange; the naked skin round the eye is green.

Measurements. Wing 174 to 203 mm.; tail 54 to 69 mm.;

tarsus 47 to 51 mm.; culmen 56 to 70 mm. Chinese birds average larger than Burmese; wing 181 to 203 against 174 to 190 mm.; culmen 56 to 61 against 61 to 70 mm.

Young birds have no lengthened scapulars; the crown and short crest are blackish streaked with buff; the upper parts are brownish; the wing-feathers are edged with buff and have apical white spots; the whole under plumage is white or buff, heavily streaked with dark brown.

Hume says that the older birds are more brown than the younger ones, especially on the lower plumage. My experience of these birds in life shows that the older the bird the purer the grey and that the birds with buff edges to the wing-feathers and very brown underparts are those of the first year after the assumption of adult plumage.

Distribution. Ceylon, India, Burma, Siam and South China, the Malay Peninsula to Java, Borneo, Sumatra etc. There is a skin of a young bird in the British Museum Collection from Cardamon Is., Laccadives, which I provisionally place under this race but which may prove to be the very dark form from the Mauritius, *rutenbergi* of Hartlaub *.

Nidification. Doig found this little Bittern breeding in a colony in the Eastern Narra, Sind, 15 nests being obtained in one "clump" of reeds. As a rule, however, it is not sociable, each pair breeding in its own fishing area, generally placing its rather crude nest of small sticks in a dense bush overhanging a stream or creek. The nest seems to be always well hidden, though the bird betrays its position by uttering a squeaky note when sitting. Those I have seen had a fairly deep depression for the eggs but no lining and were very like nests of the Pond-Heron, whilst the eggs, though perhaps averaging a little duller, could not be distinguished from those of that bird. Forty average in size 39·5 × 29·3 mm.: maxima **42·8** × **32·0** mm.; minima **33·0** × **26·3** mm. The breeding-season over the greater part of its habitat is May to August, but Vidal took eggs in the Konkan in March and April.

Habits. The Green Bitterns are very solitary, secretive little Herons. During the heat of the day they sit hunched up on the lower branches of some thick waterside bush, refusing to move until the bush is almost hit, when with a squawk they flap lazily away to another dark and shady bush. They are very crepuscular in their habits and even when they fish by day they select deeply-shaded places for the purpose and sit so close and still that their loud croak as they fly off is often the first evidence one has of their presence. They live almost entirely on small fish, frogs, crabs and mollusca and will sometimes catch fish by diving on them from their perch in bush or tree, or even dropping on them whilst in flight.

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* *Ardea rutenbergi* Hartlaub, P. Z. S., 1880, p. 39 (Mauritius), which Sharpe gives as a synonym of *B. atricapilla* (Cat. Birds B. M., xxvi, p. 173).

(2232) Butorides striatus spodiogaster.

THE ANDAMAN LITTLE GREEN HERON.

Butorides spodiogaster Sharpe, Cat. B.M., xxvi, p. 182 (1898) (Andamans).
Butorides javanica. Blanf. & Oates, iv, p. 395 (part.).

Vernacular names. None recorded.

Description. Differs from the Indian Little Green Heron in its darker grey plumage, more especially that of the neck, breast and abdomen, which are dark slaty-grey; the sides of the head have less white and are also a deeper grey.

Colours of soft parts as in the preceding bird.

Measurements. Wing 167 to 171 mm.; tail 58 to 62 mm.; tarsus 41 to 44 mm.; culmen 57 to 60 mm.

Distribution. Andamans and Nicobars.

Nidification. Exactly like that of the preceding bird but the favourite nesting-sites are on the mangrove-trees along the shore, which are partly submerged at high tide. Osmaston, Wickham and Anderson took many nests during May and June in various islands of the Andamans, nearly always built on mangroves in swamps two to four, occasionally eight, feet above high tide. The eggs are indistinguishable from those of the Indian bird but two nearly always form the full clutch. Twelve eggs average 38·2 × 28·2 mm.: maxima **40·6** × 28·7 and 40·1 × **29·9** mm.; minima **36·1** × 27·4 and 36·8 × **26·3** mm.

Habits. Similar to those of the Indian bird.

Genus NYCTICORAX.

Nycticorax Rafinesque, Analyse, p. 71 (1815).

Type by taut., *Ardea nycticorax* Linn.

In this genus the bill is very stout and deep, much compressed and with the culmen distinctly curved; the upper mandible is notched close to the tip; the head is short and comparatively thick; the head has a crest of a few narrow feathers rising from the nape; the wings are rounded, the third primary longest; the tail of twelve feathers is short; the tarsus is long and stout, about equal to the culmen in length; the upper part of the tibia is feathered, leaving about half an inch bare; the tarsus is scutellated in front, reticulated behind. The genus is practically cosmopolitan but is not found far North.

(2233) Nycticorax nycticorax nycticorax.

THE NIGHT HERON.

Ardea nycticorax Linn., Syst. Nat., 10th ed., i, p. 142 (1758) (Europa australi).
Nycticorax griseus. Blanf. & Oates, iv, p. 397.

Vernacular names. *Wák*, *Kwák*, *Tar Bogla*, *Kokrai* (Hind.);

Gadri (Sind.); *Kowa dauk, Batchka* (Beng.); *Chinta wakha* (Tel.); *Sannari* (Tam., Ceylon); *Ræ kana koka* (Cing.); *Lin wet* (Burma).

Description. Crown, nape and crest, back and scapulars black glossed with green; above the lores, forehead and supercilium white; two or three very long, narrow pure white feathers from the nape; chin, throat, fore-neck, centre of breast, abdomen and under tail-coverts white; remainder of plumage pale ashy vinous-grey, palest on the neck, darkest on the wing-quills and tail.

Colours of soft parts. Iris blood-red; bill black, greenish-yellow at the base and on most of the lower mandible; naked lores and orbital skin yellowish-green; legs and feet dull green; in the breeding-season the bill is more black and the legs and feet are pale reddish-horny.

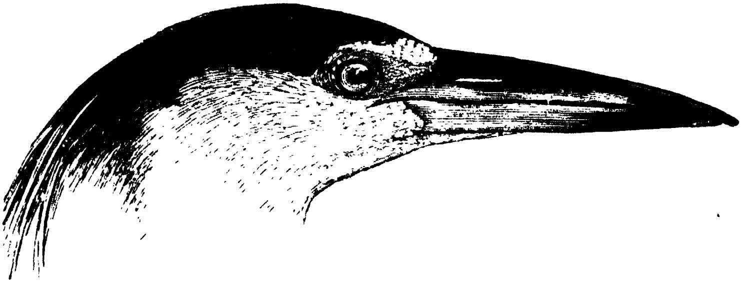

Fig. 64.—Head of *N. n. nycticorax*. $\frac{1}{2}$.

Measurements. Wing 265 to 304 mm., exceptionally only under 272 or over 289 mm.; tail 96 to 115 mm.; tarsus about 65 to 75 mm.; culmen 64 to 81 mm. but nearly all between 70 and 80 mm. The sexes do not differ in size.

Young birds have the head blackish, with shaft-streaks of rufous; the upper parts brown, streaked with rufous, the streaks broadening to white patches on the wing-coverts; primaries and secondaries rather more ashy with white spots on the tips; lower parts white or buffy-white, broadly streaked with dark brown.

Distribution. South and Central Europe; Northern Africa and the greater part of Southern and Central Asia. In our limits it is found wherever there is sufficient water.

Nidification. The Night Heron breeds over most of India from June to September, but in Kashmir they lay as early as April and in Ceylon most birds breed in March. They nest in big colonies, sometimes in company with other Herons but more often by themselves, building their nests in trees of considerable size and height and often selecting trees in gardens or in the middle of villages for this purpose. The nests are well made of large and small sticks, often being roughly lined with smaller twigs and leaves. The eggs number four or five and are of the usual Heron green-blue, generally rather pale. Fifty Indian eggs average 49·9 × 35·1 mm.: maxima **54·1** × 35·8 and 51·3 × **37·3** mm.; minima **46·1** × 35·9 and 47·2 × **32·2** mm.

Habits. The Night Heron is truly nocturnal in its habits. Not until after the sun has set for half an hour or so do the birds leave the trees, where they remain all day in the deepest shade they can get. As the sun sets they begin to get restless, preen themselves and fidget about; then one by one, never all together, they flap off their perches and wend their way to their feeding-grounds, uttering a loud, though not unmusical, squawk every few minutes as they fly. They feed on fish, frogs, crabs, crustacea and worms. Their flight consists of very deliberate flaps and, in the distance, they look very like the huge flying foxes, with whom they are often seen flying. They are extraordinarily tame birds when they are not harassed and will allow observation from within a few yards without troubling to move.

Genus **GORSAKIUS.**

Gorsakius Bonaparte, Consp. Av., ii, p. 138 (1855).

Type by orig. desig., *Ardea melanolopha* Raffles.

In *Gorsakius* the bill is as stout as in *Nycticorax* but much shorter, the culmen shorter than the middle toe and claw, which, again, are shorter than the tarsus; the nostrils are large, linear and open; the tarsus is short, stout and reticulated throughout; feet small, the toes bordered by a narrow membrane; the tail is short and of twelve feathers; the head crested, the neck short and thick; the wing rounded, with the second, third and fourth subequal, the third usually slightly the longest.

Gorsakius melanolophus.

Key to Subspecies.

A.	Wing over 250 mm.	*G. m. melanolophus*, p. 361.
B.	Wing under 240 mm.	*G. m. minor*, p. 363.

(2234) Gorsakius melanolophus melanolophus.

THE MALAY BITTERN.

Gorsakius melanolophus Raffles, Trans. Linn. Soc., xiii, p. 326 (1822) (Sumatra).
Gorsachius melanolophus. Blanf. & Oates, iv, p. 398.

Vernacular names. *Raj-bog* (Assam).

Description. Forehead, crown and crest black with a grey wash; chin and throat pale fulvous, the latter with a central black streak; sides of head and neck, back, scapulars and wing-coverts chestnut-cinnamon; the wing-coverts and sometimes the back very finely vermiculated with black, obsolete in old birds, pronounced in the younger birds, in which they form bars; edge of wing and inside shoulders mottled rufous, black and white; bastard wing and greater wing-coverts black with white tips; primaries greyish-black, tipped white, then a little brown mottling and next a chestnut bar; secondaries greyish-black with chestnut tips; lower back, rump and upper tail-coverts mottled brown and rufous; tail black, slightly rufescent at the tip; longest tail-feathers rufous-black; fore-neck and breast rufous, the centre streaked with black and whitish, remainder of lower parts mottled chestnut-black and white; thigh-coverts rufous, vermiculated black.

Colours of soft parts. Iris golden-yellow; bill fleshy-yellow, the culmen and tip horny-brown; orbital skin greenish-slate, suffused red in the breeding-season; legs and feet dull green, brownish in front.

Measurements. Wing 255 to 281 mm.; tail 96 to 112 mm.; tarsus about 67 to 79 mm.; culmen 43 to 49 mm.; birds from Palawan are very small, the wing measuring only 250 to 255 mm. but they have the culmen up to 52 mm.

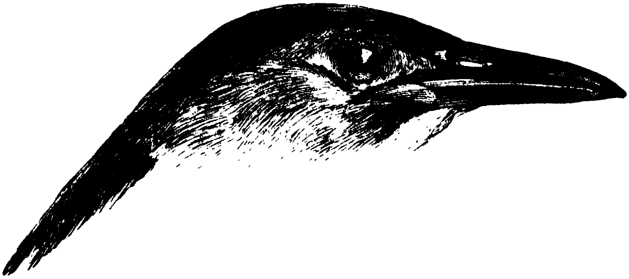

Fig. 65.—Head of *G. m. melanolophus.* ½.

Young birds. Upper plumage dark brown, the head nearly black; nape and long crest-feathers streaked with white, rest of plumage spotted with white, the wings and scapulars having numerous wavy bars of pale buff; chin and throat white with a central streak of dark brown; remainder of lower surface white, buffy-white or pale buff, each feather spotted and barred with dark brown, densely on the breast, less so on the abdomen and posterior flanks.

Distribution. Ceylon, the Malabar coast to the Southern Bombay Presidency, Assam, Manipur, Burma South through the Malay States to Sumatra, Java, Borneo and Formosa.

Nidification. Coltart and I found this Bittern breeding in some numbers in Assam during May and June, whilst Stewart found it to be even more common in Travancore, where he took many nests in June. It is a solitary bird and we never found two nests anywhere near one another. Most were built in forest trees at a considerable height from the ground but occasionally they were placed in reed beds on the top of broken-down rushes and elephant-grass. All were in dense virgin forest but nearly all were on trees on the banks of rivers and streams. The nests are made of small branches and twigs and sometimes lined with rushes and leaves. The eggs are four or five in number and differ from most Herons' eggs in being dead white, the texture smooth and close but not very glossy. In shape they are very broad ovals, both ends almost alike. Forty eggs average 46·2 × 37·2 mm.: maxima **49·1** × 38·3 and 48·0 × **40·0** mm.; minima **44·0** × 37·2 and 46·4 × **36·0** mm.

The female sits very close and when approached rises on the nest and displays just as the Painted Snipe does, raising the far side wing and depressing that next the intruder, spreading both fan-shape. Whilst thus displaying she hisses and croaks alternately. Curiously enough the display and sounds are exactly the same as those of the male when courting.

Habits. This Bittern is extremely shy and retiring and is never, I believe, found outside heavy cover, either forest or reeds. It is nocturnal like all the family and a deep booming call, not unlike that of a Common Bittern which I sometimes heard at night in the forest, was said by the Mikirs to be made by this bird. It flies like the Herons with flapping wings but much faster, whilst it often utters a croak when on the wing. The stomachs of those I have examined contained frogs, lizards and cicadæ but it must certainly also eat fish, as I have often turned it out of reeds at the edges of streams in the early mornings and late evenings.

(2235) Gorsakius melanolophus minor.

THE ANDAMAN BITTERN.

Gorsachius melanolophus minor Hachisuka, Ibis, 1926, p. 591 (Katchal, Nicobars).
Gorsachius melanolophus. Blanf. & Oates, iv, p. 398 (part.).

Vernacular names. None recorded.

Description. Differs from the preceding form in its smaller size; the supposed differences in coloration appear to be only individual and not consistent when a series is examined.

Colours of soft parts as in the typical race.

Measurements. Wing 224 to 234 mm.; tail 80 to 88 mm.; tarsus about 61 to 67 mm.; culmen about 40 to 42 mm. (once 44 mm.).

Distribution. Nicobars only.

Nidification. Nothing recorded.

Habits. Little known beyond the fact that it frequents thick forest.

Genus IXOBRYCHUS.

Ixobrychus Billberg, Syn. Faun. Scan., i, p. 166 (1828).

Type, by desig., *Ardea minuta* Linn.

In this genus of the smaller Herons or Bitterns the bill is straight and slender; the culmen flat at the base with a broad shallow groove on each side of the upper mandible; the tarsus is rather short, equal to about two-thirds of the culmen; the back of the neck is almost denuded of feathers, though this is concealed by the feathers of the side of the neck; the head is crested and the feathers of the upper breast very soft and lax; there are no dorsal or scapulary long plumes; the tail is short and of ten feathers only.

The genus is almost cosmopolitan, though not present in Northern parts.

Key to Species.

A. Tibia feathered down to joint of tibio-tarsus.	
a. Culmen about equal to mid-toe and claw .	*I. minuta*, p. 364.
b. Culmen longer than mid-toe and claw . .	*I. sinensis*, p. 365.
B. Tibia naked for some distance above joint .	*I. cinnamomeus*, p. 367.

(2236) Ixobrychus minuta minuta.

The Little Bittern.

Ardea minuta Linn., Syst. Nat., 12th ed., i, p. 240 (1766) (Helvetia).
Ardetta minuta. Blanf. & Oates, iv, p. 400.

Vernacular names. None recorded.

Description.—Male. Crown, nape, crest, back, scapulars, rump, tail and innermost secondaries glossy black; feathers above lores, sides of head and neck greyish-pink or vinous; centre of throat and neck almost white, the sides yellowish-buff; innermost coverts buff, paling to lavender-grey on the outer, the greater coverts almost white; primaries, primary coverts and outer secondaries blackish-brown or grey; upper breast ochre; lower breast blackish-maroon the feathers edged and tipped with pale golden-buff, hardly showing under the long, lanceolate ochre feathers of the upper breast; centre of abdomen, vent and under tail-coverts almost white; flanks ochre with faint dark shaft-lines.

Colours of soft parts. Iris pale yellow to orange-yellow; bill yellow, creamy-yellow or purplish-yellow, the culmen darker and browner; orbital skin pale livid green; legs and feet greenish-yellow, dull greenish-plumbeous or greenish-horny.

Measurements. Wing 138 to 156 mm.; tail 46 to 53 mm.; tarsus 45 to 51 mm.; culmen 46 (once 44 mm.) to 52 mm.

Female. Sides of head and neck more rufous than in the male; back, scapulars and innermost secondaries chestnut-brown, each feather edged with buff; wings darker and more buff than in the male and with the shoulder chestnut-brown; sides of the breast deep chestnut with pale buff streaks; thigh-coverts, flanks and lower breast boldly streaked with deep rufous; the whole of the fore-neck shows more or less dark streaking throughout.

Young birds are dark brown above, each feather edged with rufous; neck-feathers darker rufous than in the female; sides of neck and underparts white or buff, boldly streaked with chestnut and buff.

Distribution. Europe, Northern Africa, Central Asia as far East as India. In the latter country it is resident from Sind to the United Provinces and Nepal.

Nidification. The Little Bittern breeds from the end of June to September in the Himalayas, whilst Doig found eggs in the Eastern Narra, Sind, in May and August. The nest is placed in among reeds and weeds in swamps or on the edges of lakes and ponds; generally it is placed low down within a few inches of the ground or water but sometimes two or three feet above it. The nest itself is a pad of rushes, rush-blades or grass, flimsy and loosely constructed but nearly always supported by a platform of broken-down rushes. The hen-bird sits very close, Davidson catching several by hand, whilst the nest is so well concealed that it would be hard to locate did she not give it away by uttering a chuckling croak as she flutters off. The eggs number four or five to seven and are quite white, whilst in shape they are broad ovals, very little smaller at the small end than at the tip. Fifty eggs average 34·0 × 26·0 mm.: maxima **36·8** × 25·4 and 33·0 × **27·3** mm.; minima **30·1** × **25·1** mm.

Habits. The Little Bittern is extremely common in Kashmir but becomes rarer towards the East, though it has occurred, once at least, in Cachar. It is a visitor only to the plains of the Punjab but breeds in Sind and is apparently resident. Like all the small Bitterns it keeps during the day to dense reeds and other cover, feeding during the mornings and evenings and, possibly, all night, on frogs, fish, crustacea, worms etc. When beaten out of its hiding-place it flies but a short distance and then re-seeks cover. It is very active on foot and climbs the reeds with ease and celerity, uttering a hoarse, very low croak as it moves about.

(2237) Ixobrychus sinensis sinensis.

THE YELLOW BITTERN.

Ardea sinensis Gmelin, Syst. Nat., i, p. 642 (1789) (China).
Ardetta sinensis. Blanf. & Oates, iv, p. 401.

Vernacular names. *Jun-Bogla* (Hind.); *Kat-Bogla* (Beng.); *Mannal Nari* (Tam., Ceylon); *Metti-korowaka* (Cing.).

Description.—Male. Upper part of head and crest black; sides of crown showing grey; chin, throat and fore-neck pale yellowish or buffy-white, the feathers on the sides of the neck mixed pink and rufous, the longest, meeting on the back of the neck, all deep rufous; sides of the head vinous-pink; back, scapulars and innermost secondaries light brown but varying greatly, sometimes yellow-brown, sometimes grey-brown and at other times mixed chestnut, or rufous, and grey-brown; rump dark ashy; tail slaty-black; primaries, primary coverts and outer secondaries blackish; wing-coverts buff, more tawny next the back; long feathers of upper breast blackish edged with buff, generally nearly concealed by the long buff feathers of the fore-neck; flanks, axillaries and under wing-coverts white, lower breast, abdomen and under tail-coverts pale yellow-buff.

Colours of soft parts. Iris orange-yellow; bill pinkish- or yellowish-horny, the culmen darker and browner; naked skin of face pale greenish or greenish livid; legs and feet pale flesh-colour, more yellow on the joints.

Measurements. Wing 129 to 136 mm. (once 143 mm.); tail 41 to 47 mm.; tarsus 44 to 51 mm.; culmen 52 (once 49) to 57 mm.

Female only differs in having a mesial buff line down the throat and fore-neck and in old birds even this disappears and I have frequently shot pairs of birds exactly alike in plumage.

Young birds are more rufous-brown above with broad buff fringes to all the feathers; the mesial buff line down the throat and neck is more conspicuous; underparts more heavily streaked.

Distribution. India and Ceylon, East to South China through Burma, the Malay States and Archipelago to the Celebes. In India it is resident in Travancore and Malabar; breeds in Sind during the Rains, is very common in East Bengal, Assam and many parts of Burma, but rare in the rest of India and in the driest parts of Burma.

Nidification. The Yellow Bittern breeds throughout its range from June to September, but rather earlier than this sometimes in Sind. In Assam it is extremely common, though less so than the Chestnut Bittern, whilst its nest is so carefully hidden that it is most difficult to find, the bird sitting motionless though one passes within a few inches of it. Nest and site differ in no way from those of the Little Bittern but the eggs are smaller and in colour a very pale skim-milk green-blue. Forty eggs average 30·9 × 23·7 mm.: maxima **33·7 × 25·0** mm.; minima **27·5 × 22·2** mm.

In China Jones and Vaughn took eggs in May and June.

Habits. This tiny Bittern is not so exclusively crepuscular or nocturnal as the Little Bittern and I have often seen it feeding by day at the edge of reeds in swamps. When noticed it creeps away quietly into the jungle, taking long, slow steps and furtively looking round to see what is happening. It feeds principally on small frogs and water insects but doubtless eats much the same variety of food as other small Bitterns.

(2238) Ixobrychus cinnamomeus.

THE CHESTNUT BITTERN.

Ardea cinnamomea Gmelin, Syst. Nat., i, p. 643 (1789) (China).
Ardetta cinnamomea. Blanf. & Oates, iv, p. 402.

Vernacular names. *Lal-bogla* (Hind.); *Khyri-Bogla* (Beng.); *Kuruttu-koku* (Tam., Ceylon); *Metti-korowaka* (Cing.).

Description.—Male. Whole upper plumage chestnut-cinnamon, the wing-coverts slightly paler; in fresh plumage some birds have a wash of grey on the head and the outer secondaries are distinctly tipped with grey; chin, throat and upper fore-neck white with a central streak of blackish or deep rufous; lower fore-neck and extreme upper breast chestnut, paler than the back; a patch of black, buff-edged feathers on each side of the breast nearly concealed by the long chestnut feathers of the upper breast; flanks, abdomen and under tail-coverts pale chestnut; axillaries and under wing-coverts still paler and with a pink tinge.

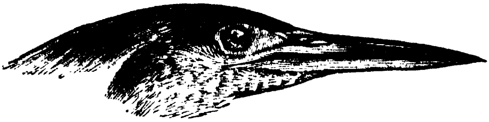

Fig. 66.—Head of *I. cinnamomeus.* ½.

Colours of soft parts. Iris yellow, orange or pinky red; bill yellow, the culmen darker and browner; naked skin deep red or reddish-purple in males, yellowish in females; legs and feet yellowish-green, the soles paler and more yellow.

Measurements. Wing 138 to 149 mm. (once 156 mm.); tail 41 to 45 mm.; tarsus 45 to 50 mm.; culmen 43 to 51 mm.

Female. Above chestnut-brown, the crown blackish; scapulars and wing-coverts with buff, black-bordered spots, obsolete in old birds; the first few primaries are mottled with brownish at the base of the inner webs; sides of head rufous or rufous-brown; underparts buffy-rufous, streaked with dark brown from chin to vent; under wing-coverts and axillaries darker rufous-buff.

Young birds are like the female but more definitely barred and spotted above; less chestnut and more brown; the lower plumage still more heavily streaked with dark brown.

Distribution. India, Ceylon, Burma, China to the Amur, Malay States and Archipelago to the Philippines and Celebes. In India it breeds in Travancore and on the Malabar coast, though it is not common; in Western India from Cutch, Rajputana and Sind to the North-West Provinces it is a breeding visitor when the Rains start. In E. Bengal and Assam Eastwards it is a very common resident throughout the year.

Nidification. The Chestnut Bittern breeds during the Rains, *i. e.*, from about the 15th of June to the end of September, making a typical nest among reeds in swamps or at the edge of lakes and quite small ponds. The normal clutch of eggs is four or five and in colour they are pure white when just laid but soon become stained and yellowish. Fifty eggs average 35·5 × 26·4 mm.: maxima **39·8** × 25·5 and 37·0 × **28·0** mm.; minima **33·1** × 26·0 and 37·1 × **25·0** mm.

Habits those of the genus, though this is much the most common species in India and Burma. In Sind and the North-West it appears to leave as soon as the country dries up and is never so common as it is in Assam and Burma, where it is very numerous in many of the big swamps. It is crepuscular in its habits but when it is undisturbed often feeds during the day if deep shade is available. It is as shy as most Bitterns are and as loth to fly if it can creep or climb away through the reeds.

Genus **DUPETOR.**

Dupetor Heine & Reichen., Nomencl. Mus. Heine, p. 308 (1890).

Type by mon., *Ardea flavicollis* Lath.

The genus *Dupetor* differs from *Ixobrychus* in having a longer bill, this exceeding the middle toe and claw; the tarsus is shorter than the bill; the back of the neck is partially naked but less completely so than in *Ixobrychus*.

The genus is confined to the Oriental and Australian regions, one species being found in India.

(2239) **Dupetor flavicollis flavicollis.**

THE BLACK BITTERN.

Ardea flavicollis Lath., Ind. Orn., ii, p. 701 (1790) (South China).
Dupetor flavicollis. Blanf. & Oates, iv, p. 403.

Vernacular names. *Kala-bogla* (Hind.); *Nal-bogla* (Beng.); *Ay-jan* (Assam); *Karu-Nari* (Tam., Ceylon); *Karawal Koka*, *Kalu Koka* (Cing.); *Khaira bog* (Nowgang, Assam).

Description.—Male. Whole of the upper plumage and wings varying from dark slaty-grey with a blue-grey sheen to almost black; lower cheek mottled buff, chestnut and black or slate; sides of neck bright ochre-yellow; chin and throat white with a line of rufous spots down the middle; fore-neck mixed with slaty-black, deep chestnut and whitish-buff; the long feathers at the base of the fore-neck dark slate with buffy-white margins; edge of shoulder of wing mottled with white; breast, abdomen and rest of lower plumage slate-grey to brownish-black, with a few white-edged feathers on the centre of the abdomen.

Colours of soft parts. Iris golden-brown to red; bill reddish-horny, paler and yellowish at the tip and terminal half of the lower mandible, bare skin purple, the eyelids bluer; legs and feet dark brown.

Measurements. Wing, ♂ 197 to 215 mm., ♀ 196 to 204 mm.; tail 63 to 74 mm.; tarsus 61 to 70 mm.; culmen 69 to 82 mm.

Female. The female is more brown above, less slaty-grey; the abdomen is a lighter brown with more white in the centre and the breast-feathers are brown streaked with white and, generally, with some rufous markings also.

Young birds have the upper plumage and wings dark brown, each feather edged with light rufous-brown; lower fore-neck and upper breast brownish-rufous with darker shaft-streaks and pale edges; the crown is nearly always more black or slaty-black.

Distribution. Practically all India but only thinly scattered here and there over the greater part. It is not rare in Ceylon and is comparatively common in Malabar and Travancore. In Eastern Bengal it is common and in Assam very common and thence it ranges through Burma to China, the Malay States and islands to the Philippines and Celebes.

Nidification. Doig found these Bitterns breeding during May in Sind but elsewhere they do not commence to lay until June, whilst fresh eggs may be taken up to September. The nest is quite typical of the family but is often placed at some height above the water on cane-bushes, bushes or even bamboo clumps. Most, however, perhaps two out of three, are built among reeds supported by a mass of broken stems. The eggs are nearly always four in number, though Jones took clutches of five and three in China which were incubated; they are of the very faintest sea-green colour possible, clear when fresh but soon becoming dingy. Forty eggs average 41·6 × 31·4 mm.: maxima **45·0** × **33·5** mm.; minima **38·8** × 30·8 and 42·1 × **30·5** mm.

Habits. Very much the same as those of *Ixobrychus* but more entirely nocturnal. In the breeding-season it has a loud, booming note not unlike that of *Botaurus* but not so loud or far-reaching. Its diet is almost exclusively fish and frogs and, like the Herons, it has a curious habit of sitting motionless with head and neck stretched out straight, with bill pointing perpendicularly to the sky.

Genus BOTAURUS.

Botaurus Stephens, Gen. Zool. (Shaw), xi, (2) p. 592 (1819).

Type by mon., *Ardea stellaris* Linn.

This genus, which contains the true Bitterns, can be easily recognized by the short, stout bill, larger feet and long, lax plumage forming decorative plumes all down the fore-neck and upper breast; the bill is short, deep at the base and much compressed, the culmen shorter than the tarsus; the nasal groove is broad and deep, the linear nostril being placed near the base; the tarsus is stout and short, being less in length than the middle toe and claw; the tibia is partly naked; the tail is short and composed of two feathers only. Sexes alike.

The genus is distributed throughout the temperate and tropical countries.

(2240) Botaurus stellaris stellaris.

THE BITTERN.

Ardea stellaris Linn., Syst. Nat., 10th ed., i, p. 149 (1758) (Sweden).
Botaurus stellaris. Blanf. & Oates, iv, p. 405.

Vernacular names. *Nir-goung*, *Baz* (Hind.).

Description. A short line from the bill to the eye buff; rest of crown and nape black, the longest feathers of the crest edged with buff at the tips and some of the side feathers edged the same: back and interscapulars black with broad ochre-buff edges, encroaching on to the black as bars at the base; lower back, rump and tail pale ochreous with numerous bars and mottlings of black; wing-coverts buff, mottled and barred with much black and a little rufous; primaries barred with rufous, turning to pink on the inner webs, and black; innermost secondaries like the scapulars but with more definite bars; sides of head ochre, faintly irrorated

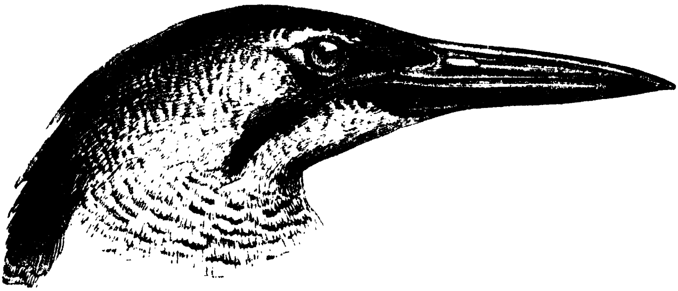

Fig. 67.—Head of *B. s. stellaris*. ½.

with black; a blackish line from the gape below the cheeks; chin and throat white, with a well-marked buff central line streaked with black and continued down to the breast; fore-neck to vent pale yellowish-buff, with broken streaks of brown and darker buff; on the sides of the breast the streaks are replaced by bars.

Colours of soft parts. Iris yellow or whitey-yellow; bill greenish-yellow, culmen darker, almost black at the tip; legs and feet dull pale greenish, more yellow at joints and on sole; "lores and round eye green to livid blue" (*Witherby*).

Measurements. ♂: wing 320 to 350 mm.; tail 95 to 116 mm.; tarsus 90 to 100 mm.; culmen 60 to 75 mm.; ♀: wing 300 to 350 mm.; culmen 65 to 75 mm. (*Witherby*).

Nestling in down. Upper parts pale chestnut to darker dull reddish-brown; below paler reddish-buff, the chin and throat albescent.

Distribution. Throughout the temperate areas of Europe and Asia from Great Britain to Japan. In India it occurs in small numbers in Winter throughout the North and straggles South to the Deccan, Bombay, Kamptee, Cuttack (*Annandale*) and, it is said, Bangalore. In Burma it wanders occasionally as far South as Pegu.

Nidification. The Bittern does not breed within Indian limits. In temperate Europe it breeds during May, rarely at the end of April or early in June. The nest is a rough untidy platform placed on broken-down reeds and rushes and composed of bits of these materials, often with the broad blades as a scanty lining. It is built low down within a few inches of the water and the site selected is normally one in a large extent of reed-bed and is therefore difficult to locate. The eggs number four to six and are a light uniform olive-brown, rarely with a few specks and spots of darker brown at the larger end. Eighty eggs (66 Jourdain) average 52·5 × 38·3 mm.: maxima **58·2** × 37·1 and 54·0 × **41·0** mm.; minima **47·5** × 35·7 and 48·4 × **33·3** mm.

Habits. The Bittern is a nocturnal bird, frequenting dense beds of rushes and reeds in swamps, showing itself very little by day unless disturbed by intruders, when it rises close by one and flaps noiselessly away for a couple of hundred yards before again pitching. Its ordinary call is a hoarse, low croak but during the breeding-season it utters a deep booming note which can be heard at a great distance. When calling thus its throat and neck are much distended, the feathers puffed out and loose, whilst the head is held erect. Young birds when disturbed either squat low among the reeds or stand erect with neck and head stretched out parallel to the reeds and are difficult to distinguish from them. They feed on fish, frogs and all kinds of small reptiles, do not disdain the young of other birds which nest in swamps, and will devour any kind of insects, worm or grub.

Order XIII. PHŒNICOPTERI.

The position of the Flamingos is difficult to determine and recent anatomical and biological work has done little to elucidate the question. In the 'Systema Avium Æthiopicarum' Sclater has merely followed Evans, who followed Gadow and dealt with the Flamingos as a Suborder, *Phœnicopteri*, of the great and extraordinarily mixed Order *Ciconiiformes*, which contains such families as the Storks, Boobies, Cormorants etc. Hartert keeps the *Phœnicopteri* as a separate Order, whilst in my 'Indian Ducks' the Ducks and Flamingos were both retained under this one Order. Perhaps this latter arrangement is the one which will finally have to be adopted but for the present it may be safer to raise my two Suborders, *Phœnicopteri* and *Anseres*, to the rank of Orders and this is the course now adoptod.

Next to the excessively long legs and neck the most striking feature of this Order is the bill, which is covered with a soft epidermis and bent down in the middle; the lower mandible is very thick and almost immovable, whilst the upper is much more slender and moves as if on a hinge; the margins of both mandibles are furnished with lamellæ as in the Ducks; the tarsi and long, bare tibia are scutellated in front and behind; the feet are rather small and fully webbed between the anterior toes; the hallux is small or wanting; the tongue is very thick and fleshy.

The skull is desmognathous and holorhinal, basipterygoid processes are rudimentary or wanting; the nostrils are narrow pervious slits; the cervical vertebræ number eighteen or nineteen; there are two carotids, the right being much larger than the left, the two uniting at the base of the neck; the cæca are very large; the wing is aquincubital with twelve primaries; the oil-gland is present and tufted; an aftershaft is present; there are no apteria at the base of the neck and both the dorsal and ventral are short; the ambiens, accessory femoro-caudal, semi-tendinosus and accessory semi-tendinosus present; femoro-caudal absent; the deep plantar tendons are completely united, dividing again to supply the anterior toes, a condition obtaining in most birds in which the hallux is rudimentary or wanting.

The Order contains but one family, the *Phœnicopteridæ*, which is found over the greater part of Europe, Africa and Western Asia.

Family PHŒNICOPTERIDÆ.

Characters those of the Order.

Key to Genera.

A. Upper mandible overlapping lower; throat naked..............................	PHŒNICOPTERUS, p. 373.
B. Upper mandible not overlapping; throat feathered	PHŒNICONAIAS, p. 375.

Genus PHŒNICOPTERUS.

Phœnicopterus Linn., Syst. Nat., 10th ed., i, p. 139 (1758).

Type by mon., *Phœnicopterus ruber* Linn.

In *Phœnicopterus* the upper mandible overlaps the lower and the throat is naked.

Phœnicopterus ruber.

Phœnicopterus ruber Linn., Syst. Nat., 10th ed., i, p. 139 (1758).

Type-locality: Bahamas, West Indies.

(2241) Phœnicopterus ruber antiquorum.

THE FLAMINGO.

Phœnicopterus antiquorum Temm., Man. d'Orn., 2nd ed., ii, p. 527 (Europe).
Phœnicopterus roseus. Blanf. & Oates, iv, p. 408.

Vernacular names. *Bog-hans*, *Raj-hans* (Hind.); *Kán-thunti* (Beng.); *Pu-konga*, *Samdrapa-chilluka* (Tel.); *Punari* (Tam.); *Urian* (Tam., Ceylon).

Description.—Male. Whole plumage with the exceptions noted a beautiful rosy-white; the rose-colour much deeper on the tail and rather deeper on the head and neck; primary coverts nearly or quite white; other coverts and innermost secondaries light rose-red; primaries and outer secondaries black; under wing-coverts and axillaries scarlet, under median and primary coverts black.

Colours of soft parts. Iris lemon-yellow, pale yellow or golden-yellow; orbital skin fleshy-pink to bright red; bill bright flesh-coloured; edge of upper mandible and terminal third black; legs and feet pinkish-red, claws black.

Measurements. Length 1,000 to 1,300 mm.; wing 393 to 444 mm.; tail 152 to 189 mm.; tarsus about 311 to 327 mm.; culmen about 139 to 164 mm.; the bare part of the tibia is about 220 to 250 mm.

Female similar to the male but the rose-colour generally less pronounced. It is also smaller, wing about 375 to 405 mm.; culmen about 120 to 143 mm.

Young birds. Head, neck and lower plumage white, tinged with rosy-buff; back and wing-coverts ashy-buff with dark shaft-stripes; the greater coverts more brown but with paler tips soon wearing off; under wing-coverts and axillaries pale pink; bill more dull than in adults; legs dark plumbeous.

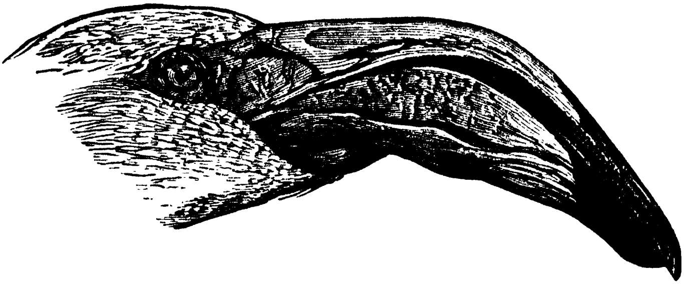

Fig. 68.—Head of *P. ruber*. ½.

Nestling. Down white, more or less tinged with grey, especially on the upper parts; down in texture like that on a nestling Swan. At this stage the bill is perfectly straight but soon assumes the adult shape.

Distribution. Southern Europe, more or less confined to the coast-line; practically the whole of Africa and Asia as far East as Lake Baikal and India.

In India it is found here and there over the whole continent, South in Ceylon, East to Assam, where it was obtained by McLelland, Eastern Bengal, where I have seen it, but not in Burma.

Nidification. It possibly breeds in Ceylon, though this has never been definitely proved, whilst there was no record of the Flamingo breeding in India until the Rao of Cutch discovered a breeding place eight miles North-East of the Pachham in the Rann. His description of the nests agrees well with descriptions of those in European colonies. The nests are inverted cones of wet mud, which become very hard when dry, placed sometimes in groups, sometimes much scattered, on ground which is slightly raised above the surrounding flooded country, although their bases may be actually in the water. In the Rann His Highness found the eggs were laid in August but in the Persian Gulf, where the birds breed on the islands in great numbers, they are laid in April. The eggs are generally two in each nest but occasionally one only. In colour they are a skim-milk blue but the hard inner shell is incrusted with a dense layer of calcium, which soon becomes stained, though pure white when fresh. One hundred eggs (*Jourdain*) average 88·8 × 54·5 mm.: maxima **103·5** × 56·5 and 93·7 × **61·0** mm.; minima **77·0** × 48·4 and 94·5 × **47·7** mm.

The Flamingo has a curious habit of dropping eggs at odd times before and after the usual breeding-season and such eggs have been picked up by Barnes, Hume and others in India.

Habits. Although so ungainly in shape when viewed individually, the Flamingo when seen in the vast herds in which they so often collect is one of the most beautiful of Avian sights. In the distance they look like a field of snow with a rosy sunset glow upon it, then, as one approaches, the snow suddenly melts into a flaming scarlet as the birds unfold their wings and sail away. When just moving from one feeding-ground to another they adopt no particular formation but when in full flight form into either a wide \/ or a long waving ribbon. They spend most of their time either wading or standing on the shores of lakes, sea-coasts etc. Their food is obtained entirely in the water; much of it is of a vegetable nature but they also eat tiny water insects, crustacea and mollusca, whilst in the South of France and Spain they feed almost exclusively on a tiny brine shrimp (*Artemia salina*). Their method of feeding is curious; their long heads are bent down between their equally long necks and their bills, thus inverted, are moved slowly backwards and forwards, gently stirring up the mud so that their bills trap the sought-for food which the lamellæ enable them to retain.

They have a rather Goose-like call but are, on the whole, very silent birds.

Genus PHŒNICONAIAS.

Phœniconaias Gray, Ibis, 1869, p. 440.

Type by mon., *Phœnicopterus minor* Geoffroy.

In this genus the upper mandible does not overlap the lower and the neck is well feathered. It contains but one species.

(2242) Phœniconaias minor.

THE LESSER FLAMINGO.

Phœnicopterus minor Geoffr., Bull. Soc. Philom., i, ii, p. 98, figs. 1-3 (1798); Blanf. & Oates, iv, p. 410 (1898).

Vernacular names. None recorded.

Description.—Male. General colour a bright pale pink; feathers at the base of the bill crimson; the longest scapulars and median wing-coverts crimson, the latter edged paler; other wing-coverts and the edges of the under wing-coverts rosy; the greater under wing-coverts and quills black; axillaries crimson; rectrices darker and with the outer webs tinged with crimson; under tail-coverts subtipped with a tinge of crimson. Some old males, perhaps during the breeding-season only, have the feathers of the back with crimson shaft-stripes.

Colours of soft parts. Iris red minium; bill dark lake-red, with the tips black; feet red (*Antinori*).

Measurements. Length 850 to 1,050 mm.; wing 329 to 354 mm.; tail about 120 to 142 mm.; culmen 100 to 118 mm.; tarsus about 190 to 242 mm.

Female. Similar to the male but smaller and paler, without the crimson scapulars, and with no crimson on the back or breast.

Measurements. Wing 310 to 325 mm.; culmen about 93 to 104 mm.

The young appear to be very like those of *Phœnicopterus roseus* but with a more rosy and less brown or buff tinge; altogether brighter, paler birds.

Distribution. This bird extends through South Africa but the extent of its range Northwards on the West Coast is still doubtful. In the East it is found on many parts of the coast as far North as Abyssinia and also in Madagascar. From N.E. Africa it extends to N.W. India.

Nidification. The Lesser Flamingo has been recorded from various parts of India from the end of September up to the beginning of July and cannot breed very far from our shores. In all probability most of the birds which visit us breed on the west coast of the Red Sea and if such is the case there would be nothing very remarkable in the shortness of the time elapsing between the departure of the last birds and the arrival of the earliest ones in the following September and October.

The only note I can find regarding this Flamingo is that made in the Journal of the B.N.H.S. by the late E. Barnes, who says that he obtained an egg from a fisherman, who found it on a sand-bank in the Indus. This egg, from its very small size, he believed to have belonged to the present species. It measures 88·0 × 54·0 mm., whilst another egg taken in Tunis measures 85·4 × 53·4 mm.

Habits. This bird is only a rare visitor to the North-West of India. It has been recorded from Sind, Secunderabad, near Delhi, and on the Sambhur Lake, where Adams records it as occurring in great numbers but very irregularly. In its habits it seems to very closely resemble the Common Flamingo.

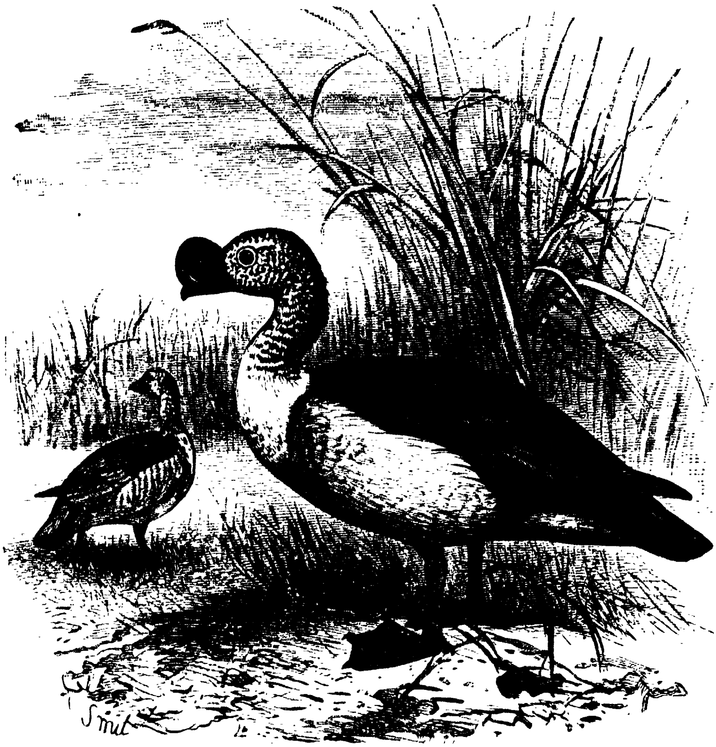

Fig. 69.—*Sarkidiornis melanotus.*

Order XIV. ANSERES.

As noted under the previous Order the only birds now included in the *Anseres* are the true Swans, Geese and Ducks, though it is possible that eventually the Flamingo and Ducks will have to be relegated to the rank of suborders under the one order, *Chenomorphæ.*

In this Order the three anterior toes are united by webs, extending, except in one Australian genus, *Anseranas*, to the ends of the digits; the hind toe is always present, though it is short and joined to the tarsus on a higher plane than the front toes; the bill, except in the *Merginæ*, is depressed and flattened and is covered with a soft membrane, except on the dertrum, or nail, which forms the tip of the upper mandible; both mandibles are fringed inside with tomiæ, or edges, with lamellæ, which are variously developed in different genera.

The skull is desmognathous and holorhinal; basipterygoid processes are represented by oval facets, articulating with the pterygoids close to their anterior extremity, as in the *Gallinæ*; the angle or posterior extremity of the lower jaw is produced backwards beyond the articulation with the quadrate and is curved upwards; the nostrils are pervious but vary in shape; the furcula is U-shaped and strong; the posterior border of the sternum is furnished with a notch, represented in some genera by a foramen on each side of the keel; there are two carotids of equal size; the cæca are large; there is a tufted oil-gland; the wings are aquincubital with eleven primaries; the aftershaft to the body-feathers is rudimentary or wanting; there are no apteria on the neck; the ambiens, femoro-caudal, a very large accessory femoro-caudal and semi-tendinosus muscles present; as in most swimming birds the accessory semi-tendinosus is absent; the *flexor longus hallucis* sends off a slip to the hallux and then fuses with the *flexor perforans digitorum*, which supplies the three anterior digits; the tongue is large and fleshy, denticulated at the sides to fit in with the lamellæ; the males have a large spiral intromittent organ.

The young are hatched covered with down and are able to run and swim as soon as this dries. In moulting most of the species of this family shed all their quill-feathers at once and are consequently, for a time, unable to fly.

There is but one family, which is cosmopolitan.

Family ANATIDÆ.

The characters of the single family are the same as those for the Order.

The question of the number of subfamilies into which the family should be divided has been much discussed but the eight which I accepted when writing 'Indian Ducks' seem to be convenient and easily diagnosed, so I retain them here.

Key to Subfamilies.

A. Hind toe not lobed.
  a. Neck as long as, or longer than, the body .... *Cygninæ*, p. 379.
  b. Neck not as long as body.
    a'. Hind toe rather long, tail-feathers rather long. Upper parts glossy .. *Plectropterinæ*, p. 385.
    b'. Hind toe moderate, tail-feathers rather short. Upper parts not glossy. No cere................ *Anserinæ*, p. 396.

B. Hind toe very narrowly lobed.	
c. Bill short and Goose-like	*Chenonettinæ*, p. 392.
d. Bill rather flat and broad	*Anatinæ*, p. 408.
C. Hind toe broadly lobed.	
e. Bill more or less depressed.	
c'. Tail-feathers normal..............	*Nyrocinæ* *, p. 447.
d'. Tail-feathers narrow and very stiff..	*Erismaturinæ*, p. 463.
f. Bill more or less compressed, never depressed	*Merginæ*, p. 465.

Subfamily CYGNINÆ.

The Swans are so easily identified by the veriest beginner in Ornithology that it is hardly necessary to add anything to the above key; the cervical vertebræ number 23 to 25, the hind toe is not lobed, whilst Indian Swans are all pure white when adult. Sexes alike.

The subfamily contains three genera, of which but one, *Cygnus*, is represented in India. Of the other two genera, *Chenopsis* is confined to Australia and *Coscoroba* to South America.

Genus CYGNUS.

Cygnus Bechst., Orn. Taschenb., ii, p. 404 (note) (1803).

Type, *Cygnus olor* Edw.

The distinguishing feature of this genus is that of the subfamily, the very long neck: 23 or more cervical vertebræ as against less than 20 in other forms; the bill is of moderate size, raised at the base and of nearly equal breadth throughout; the nostrils are elliptical and placed about half-way down the bill; the lores are naked; the tarsi are short and stout and placed very far back; the wing is long, the first primary about half the length of the second and the second and third subequal and longest; the tail is short and well rounded.

Swans are to be found throughout the temperate and Subarctic regions of the world.

Key to Species.

A. Lores and triangular patch between forehead and gape yellow or orange-yellow, never black. No knob at base of bill.	
a. Yellow on bill extending right up to the nostril and sometimes still further towards tip of bill	*C. cygnus*, p. 380.

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* As the genus *Fuligula* is now united with *Nyroca* (which, moreover, is the earlier name and should, therefore, give the name to the subfamily) the name *Fuligulinæ* cannot be employed.

b. Yellow never reaching to nostril and generally confined to somewhat circular patch on base.
  a'. Bill longer, broader but less high at the base in comparison. Serrations hardly visible on bill when closed .... *C. minor*, p. 382.
  b'. Bill shorter, not so broad but comparatively high at base. Serrations visible along nearly whole length of bill when closed .... *C. bewickii*, p. 381.
B. Lores and triangular patch black. A knob at base of bill in adults .... *C. olor*, p. 383.

(2243) Cygnus cygnus.

THE WHOOPER.

Anas cygnus Linn., Syst. Nat., 10th ed., i, p. 122 (1758) (Sweden).
Cygnus musicus. Blanf. & Oates, iv, p. 414.

Vernacular names. None recorded.

Description. Pure white, rarely showing a slight rufous-grey wash on the head, this probably due to immaturity.

Colours of soft parts. Iris hazel; bill black, the base of the bill yellow; legs, toes and webs black.

Measurements. ♂: wing 578 to 631 mm.; tail about 160 to 180 mm.; tarsus 115 to 123 mm.; culmen 100 to 113 mm.; ♀: wing 560 to 594 mm.; culmen about 95 to 107 mm.

Weight, ♂ 16 to 28 lbs., ♀ 15 to 22 lbs. Indian birds are nearly all immature and weigh much less; Hume gives the weight of one as 8·25 lbs. A specimen shot by General Osborn weighed 21 lbs.

Young birds a pale grey-brown throughout.

Nestling in down white.

Cygnus cygnus can be distinguished from other Swans with yellow lores by its great size when adult, whilst the bill is comparatively as well as actually longer, being very seldom as short as 100 mm. In shape, too, it is distinctive, the upper outline running straight from tip to base of forehead, where it is less deep in proportion than the bill of *C. bewicki.* In coloration the yellow on the base of the bill in the Whooper extends right down to the upper corner of the nostril and often beyond it; the outline between the black and yellow is very ragged, the two colours running into one another, though not fusing into an intermediate tint. The serrations in the upper mandible are not visible when viewed from the side.

The young have the bill a dull flesh-colour, with the tip and margins black, which extends with advancing age until it leaves only an orange band across the nostrils; the bases of both mandibles are very pale yellowish-green or greenish-white. In the adult bird the bill has the terminal half black, the base and margins of the maxilla yellow.

Distribution. The whole of Northern Europe and Africa, extending to Japan and Greenland. Buturlin gives its most northern breeding-place as Verkhore-Kolymsk, 65° 4½ N.; south it extends in Winter to Southern Europe, Asia Minor, Persia, India and China.

In India it has occurred very seldom. One, Nepal (*Hodgson*, 1829); one on the Beas River, Punjab (*Osborn*, Jan. 1900); one, Larkhana, Sind (*Crerar*, 1904); two, Dora Momim, Kabul River (*Magrath & Donlea* 1910) and one, Rajputana, (1925), in the grey plumage.

Nidification. The Whooper breeds in the open tundras of Iceland and Northern Europe and Asia during June, but in warm years they commence to lay at the end of May and at other times they do not lay until July or even August. The nest is a huge structure of sticks, leaves, moss, rushes etc., densely lined with masses of white down, which the birds commence to pluck when the first egg is laid, continuing to do so until some time after the last is deposited. They lay four to six eggs but occasionally are said to have as many as seven. Seventy-five average (*Jourdain*) 112·8 × 72·6 mm.: maxima **126·3** × 76·3 and 114·0 × **77·4** mm.; minima **105·2** × 72·0 and 117·0 × **68·2** mm. In colour the eggs are pale yellowish-white or ivory-white.

Habits. Swans associate in small herds during the non-breeding season and visit India in numbers up to seven together, keeping to the larger rivers and open waters. They feed on grass, clover, water-plants, grain and also on worms, insects, mollusca and land-snails etc. A young Swan is not a bad bird for the table but old ones are not very palatable.

(2244) Cygnus bewickii.

BEWICK'S SWAN.

Cygnus bewickii Yarrell, Trans. Linn. Soc., xvi, p. 453 (1850) (Yarmouth, England).

Vernacular names. None recorded.

Description. Of the Swans with yellow lores, Bewick's Swan is the smallest, seldom having a wing exceeding 532 mm.; indeed, Buturlin gives the greatest measurement of any bird measured by him as 520 mm. The bill is strikingly shorter than that of *C. cygnus*, being seldom, if ever, over 94·2 mm., whilst it is, on the other hand, comparatively much deeper at the base, measuring up to 43·6 mm.; the diminution in depth, from forehead to tip, is also much more abrupt, so that the upper outline presents a concave appearance. The serrations of the upper mandible in the closed bill are visible over about two-thirds of the total length of the bill when viewed from the side. In coloration the yellow is restricted to a portion of the base above, never touching the nostril, and is nearly always well defined from the black in a clean, curved line enclosing the higher extremity of the hollow in which the nostril is placed and thence extending back along the margin of the upper bill to the gape. The feet also are much smaller, the tarsus generally being less than 110 mm., whereas in *musicus* it is generally over 115 mm., whilst Buturlin gives the smallest of his series of the latter bird as 115 mm.

Colours of soft parts. Iris brown; bill, as described above, black with yellow bars; legs and feet black.

Measurements. ♂: wing 515 to 530 mm.; tail 150 to 168 mm.; tarsus 100 to 115 mm.; culmen 90 to 98 mm.; ♀: wing 475 to 525 mm.; culmen 84 to 95 mm. (*Witherby*).

Distribution. Over Northern Europe and Asia as far East as the Lena Delta. In Winter it extends South into Central Europe and South Russia as far as the Caspian and in Asia as far South as Persia, Northern India and Central West China, extending in some numbers as far West as Great Britain. The records of its appearance in South-East China and Japan probably generally refer to the next bird, *minor*.

Occurrences in India. (1) One by Mr. B. L. McCullock at Jacobabad, in Sind, on the 2nd of December, 1907. (2) A female shot by Major P. C. Elliot-Lockhart near Mardan, on the North-West Frontier, on the 30th of December, 1910.

Nidification. Bewick's Swan breeds from Northern Russia to Western Siberia, where it meets and overlaps with *Cygnus minor*, both species having been found breeding together on the Lena River. The site selected is one in open tundra close to rivers or on islands in the rivers, the nest itself being similar to that of other Swans, a pile of all sorts of vegetable rubbish lined with down. The eggs are white but soon become stained a yellow-buff; the full clutch seems to be three or four but not much is yet known of the breeding of the Swan beyond what Buturlin has written. Twelve eggs average 104·1 × 66·4 mm.: maxima **114·0** × 69·1 and 109·0 × **70·1** mm.; minima **99·1** × 65·1 and 101·8 × **64·6** mm.

Habits. Those of the genus. This Swan sometimes eats fish in addition to the usual food indulged in by Swans.

(2245) Cygnus minor.

ALPHERAKY'S SWAN.

Cygnus minor Keyserling & Blas., Werbelthiere, pp. lxxxii & 222 (1840) (Selenga River, Transbaikalia).

Vernacular names. None recorded.

Description. Buturlin* describes this Swan under the name of *Jankowskii* as "altogether larger than *C. bewicki*, while the yellow of the bill is somewhat more developed, but the best diagnostic character is its much broader bill. Fully adult examples of *C. bewicki* have the maximum breadth of the bill 28·0 to 30·5 mm.; exceptionally reaching to 31·0 mm., but then this specimen has the bill from the eye 122 mm. long."

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* Buturlin, 'Ibis,' 1907, p. 651.

This character generally holds good but two specimens of *bewickii* in the British Museum have the breadth of the bill 31·7 and 32·0 mm. respectively. In *minor*, however, the bill is always nearly straight at the base of the culmen, whilst in *bewickii* it is distinctly concave, the bill is longer in proportion to its depth and the yellow at the base is darker and tinged with orange.

Colours of soft parts as in Bewick's Swan but darker, more orange-yellow on the base of the bill. When viewed sideways three or four of the lamellæ can be seen.

Measurements. Wing 490 to 550 mm.; culmen 94 to 99 mm. The bill of our only Indian-killed specimen measured well over the 100 mm.

Distribution. Siberia from the Lena delta to the extreme East. In Winter South to China and once India.

Nidification. This Swan was discovered breeding on the Lena delta in company with Bewick's Swan, though there was no evidence of their interbreeding. Nests and their sites were similar to those of that bird. The only two authentic eggs I have seen and four measured by Jourdain average 108·1 × 71·0 mm.: maxima **112·0** × **73·0** mm.; minima **104·1** × 71·5 and 111·2 × **69·0** mm.

Habits. Apparently similar to those of other Swans. The only certain record of the occurrence of this Swan in India is one shot by Mr. Hornsby on the 2nd of January, 1911, at Tubi, Campellpur. When I saw this specimen in August of the same year the orange tint of the bill was still very noticeable. Harington saw what he believed to be a Bewick's Swan near Maymyo which may have been of this species, and probably most of the reported occurrences of Bewick's Swan in China really refer to this species. La Touche's specimen was undoubtedly *minor* and not *bewickii*.

(2246) Cygnus olor.

THE MUTE SWAN.

Anas olor Gmelin, Syst. Nat., i, p. 502 (1788) (Russia).
Cygnus olor. Blanf. & Oates, iv, p. 413.

Vernacular names. None recorded.

Description. The whole plumage white with the exception of the lores, which are black.

Colours of soft parts. Iris dark brown; upper mandible reddish-horny, the tubercle, base, nostrils, margins and nail black; lower mandible wholly black; legs and feet dull black.

Measurements. "♂: wing 560 to 622 mm.; tail 189 to 198 mm.; bill from knob 70 to 85 mm.; ♀: wing 535 to 570 mm.; bill from feathers 72 to 90 mm." (*Witherby*).

Weight about 15 to 20 lbs., in a wild state rarely running up to 24 to 25 lbs. In a domesticated state birds of over 30 lbs. occur.

Young. Crown brown with white tips to the feathers; sides of head and neck mixed grey and white; upper parts pale grey-brown, the centre of the mantle paler and more grey; some of the scapulars white at the base; underparts white suffused with grey-brown on the flanks, sides of the breast and under tail-coverts.

Nestling in down. Upper parts greyish-brown; underparts white.

Of the specimens in India nearly all have been young birds retaining traces of the juvenile plumage, the tubercle absent or only slightly developed and the feathers of the forehead and the base of the bill prolonged to a point.

Distribution. Central and South-Eastern Europe, Western and Central Asia. In Winter it migrates South to Africa on the North-East, Palestine, Arabia, Asia Minor, Afghanistan, Baluchistan and North-West India. The occurrences in India are as follows:—One, Shah Alum River, Punjab, 1857 (*W. Mahomed Amar*); two, Jubee Stream, N.W. Provinces, 1871 (*Unwin*); three, Sewan, Sind, 1878 (*Watson*); two, do., do., 1878 (*Waterfield & Sinclair*); two, 1900 (*Jones*); one, Karachi, Sind, 1900 (*Cumming*); Sita Road Station, 1900 (Natives); four, Baluchistan Frontier, 1900 (*Matthews*); Manchur Lake, Sind, 1900 (*Crerar*); one, Metong, Indus (*Wragge*); Naoshera, Punjab, 1910 (*O'Brien*); one, River Sohan, Johore, 1911 (*Lord*); one, Lahore, 1911 (*Glascock*).

Nidification. In its wild state this Swan is said to breed either in colonies or singly, making the usual large nest of all kinds of vegetable rubbish and water-weeds, more or less lined with down. The nests may be built in swamps in vast reed-beds, on open tundra round lakes and ponds or upon small islands in rivers and lakes. The eggs are said normally to number six or seven but clutches of eight to twelve have been recorded, whilst others of three and four have been found incubated. They differ from other Swans' eggs in being greenish in colour. Jourdain gives the following measurements:—Average of fifty 114·5 × 73·1 mm.: maxima **122·9**×77·1 and 119·0×**80·0** mm.; minima **105·0**×73·0 and 112·0×**70·0** mm.

The breeding-season is April and May.

Habits. Much the same as those of other Swans. Its diet is said to be mainly vegetarian, mixed with worms, snails and insects.

Subfamily PLECTROPTERINÆ.

The distinguishing features of this subfamily are the rather long hind toe, without lobes and the neck shorter than the body; the upper plumage, especially in the male, is more or less glossy; the tail is rather long.

Three genera are represented in India, though two of these, *Asarcornis* and *Rhodonessa*, which are peculiar to our area, are represented by single species only.

Key to Genera.

A. A large fleshy comb at the base of the culmen in the male; wing over 250 mm.. SARKIDIORNIS, p. 385.
B. No comb at base of mandible in male; wing over 250 mm.
  a. Bill in length at least equal to double the breadth at the base.
    a'. Head nearly all black and white .... ASARCORNIS, p. 387.
    b'. Fore-neck and most of head pink, bright in male, dull in female .... RHODONESSA, p. 390.

Genus SARKIDIORNIS.

Sarkidiornis Eyton., Monogr. Anatidæ, pp. 20, 102 (1838).

Type by mon., *Anser melanotus* Pennant.

The genus *Sarkidiornis* differs from all other Indian genera in having a spur on the shoulder of the wing, a feature which was formerly considered of sufficient importance to constitute the genus into a family by itself. The bill is of moderate length, furnished in the male with a fleshy knob on the base, which becomes greatly swollen in the breeding-season (see fig. 69); the tail of twelve feathers is long and graduated; the lower end of the trachea is expanded on one side only; the hind toe is narrowly lobed.

(2247) Sarkidiornis melanotus.

THE NUKHTA OR COMB-DUCK.

Anser melanotus Pennant, Indian Zool., p. 12, pl. 12 (1769) (Ceylon).
Sarcidiornis melanonotus. Blanf. & Oates, iv, p. 423.

Vernacular names. *Nukhta* (Hind.); *Nukwa* (Chota Nagpur); *Naki-hansa* (Ooriya); *Jutu-chiluwa* (Tel.); *Dod-sal-haki* (Can.); *Neer-koli* (Coimbatore); *Tau-bai*, *Mauk-ton* (Burma); *Bowk-bang* (Karen); *Karo Hang* (Sind).

Description.—Male. Head and neck white, spotted with metallic-black feathers, coalescing more or less on the crown, nape and hind-neck; lower neck and whole lower plumage white, tinged sometimes with rufous-grey; rest of upper plumage and wings black, glossed with green and blue, except on the secondaries, which are glossed with brown, and the scapulars, on which the gloss is purple; tail dark brown; sides of the body tinged with grey; a black mark, almost a demi-collar, on each side of the neck; a black band in front of the under tail-coverts descending from the rump; lower back grey.

Colours of soft parts. Iris dark brown; bill and comb black; legs and feet plumbeous. Young birds are said to have the iris almost black.

Measurements. Wing 339 to 406 mm.; tail 139 to 153 mm.; tarsus about 64 to 75 mm.; culmen about 63 to 70 mm.; comb 55 to 60 mm. in breeding-season.

Female only differs in having no comb and in being rather smaller; the black everywhere is much less glossy and the lower back and rump are grey-brown; the neck and head are often more profusely marked with black. Wing about 280 to 309 mm.; culmen about 59 to 66 mm.

Nestling in down. Upper parts dull grey-brown; a white frontal line is continued back over the eye; a white crescentic band outlines the back of the rather darker crown; narrow brown bands commence behind the ear-coverts and meet on the hind-neck; two white patches on the side of the back near the base of the wing and two others on the sides of the rump; lower surface greyish-white.

Distribution. Rare in the Punjab in the cis-Sutlej; absent from North and West Sind, resident over the whole of the rest of India and Ceylon where there is water available. In Eastern Bengal it is rare but has occurred in the Sunderbunds, Jessore and Khulna; in Assam it has occurred in Cachar, Sylhet and the Looshai Hills. In Burma it is rare in the North but becomes common in Pegu.

Nidification. The Comb-Duck breeds throughout its area from June to September. Normally the nesting-site is a large natural hollow in some tree, the eggs being laid either on the bare wood or upon a rough nest of sticks, grass and leaves but no down appears ever to be used as a lining. Sometimes the bird selects a hollow where the main branches spring from the trunk; occasionally a hole in a bank is used and, still more rarely, the nest of a Vulture or Stork. As a rule the full clutch numbers eight to a dozen but Anderson once found forty eggs in a nest, whilst Livesey took no fewer than forty-seven from one nesting hole. In colour the eggs are a pearly-white, very highly glossed when fresh and one hundred average 61·8×43·3 mm.: maxima 66·7×44·1 and 63·2×45·4 mm.; minima 56·0×42·5 and 58·0×42·0 mm.

Habits. The Comb-Duck is a bird of well-wooded open country, frequenting neither dense forest nor open plains. Ample water is, of course, a necessity but this may be marsh, lake, river or canals; in such places it is found in small flocks, probably families, which break up when the breeding-season commences. These Ducks fly well and strongly, swim equally well and fast and are said by Tickell to be expert divers. They also run and walk well and can perch on any branch large enough to hold them without being grasped. Their ordinary note is a low, hoarse croak but in the breeding-season they have a fine loud "honk." They feed principally on a vegetarian diet, of which rice, both in grain and young leaves, forms an unfortunately large part. They also eat worms, spawn, small frogs, larvæ and occasionally small fish. Young ducklings when they first fly are good-eating but old birds are not worth shooting for the pot.

Genus **ASARCORNIS**.

Asarcornis Salvadori, Cat. B. M., xxvii. p. 59 (1895).

Type by mon., *Anas scutulata* Müller.

This genus is one specially created by Salvadori for the White-winged Wood-Duck, which previously had been placed either with *Sarkidiornis*, *Casarca*, *Anas* or *Tadorna*. It seems to be allied most nearly to the first-mentioned of these genera, differing in possessing no comb or spur and in having a flatter and larger bill. There is no other member of the genus.

(2248) **Asarcornis scutulatus.**

The White-winged Wood-Duck.

Anas scutulata Müller, Verh. Land- en Volk., p. 159 (1839–44) (Java).
Asarcornis scutulatus. Blanf. & Oates, iv. p. 424.

Vernacular names. *Deo-hans* (Assam); *Hayrani Daophlantu* (Cachari).

Description.—Male. Head and upper part of neck white, thickly spotted with black, the black spots usually more numerous on the upper part of the head and neck; lower part of the neck and mantle glossy black, the whole of the lower parts rich chestnut-brown, more or less mottled, when freshly moulted, with glossy black on the breast and abdomen; back, rump and upper tail-coverts olive-brown, glossed with metallic-blue and green; scapulars olive-brown; smaller upper wing-coverts white, the median ones a soft blue-grey, broadly tipped with black, which is highly glossed in old males; quills olive-brown, the secondaries with the outer webs bluish-grey, forming a speculum; the first inner secondary white on the outer web, whilst the quill next it has a large white patch on the same web; under wing-coverts and axillaries white, the former with a few brown feathers mixed; tail blackish, glossed with green in old males

Colours of soft parts. The bill varies from lemon-yellow to deep orange, the base and tip black and with black mottlings everywhere, generally least numerous about the centre of the bill; gonys paler, as a rule, than the rest of the bill. During the breeding-season the base of the maxilla becomes considerably swollen, though it never becomes an actual comb, whilst the orange colour deepens to deep orange-red or light red. The legs and feet vary, like the bill, from lemon-yellow to a dull orange. The joints, toes and webs are almost invariably mottled with dull greenish, and patches of the same colour are to be found on the tarsus itself. The toes are always dark. Irides brown or blood-red in old birds.

Measurements. Length about 750 mm.; wing 363 to 401 mm.; tail 127 to 178 mm. (according to condition): culmen 58 to 66 mm.; tarsus 54 to 60 mm.

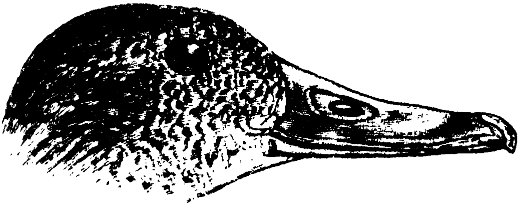

Fig. 70.—Head of *A. scutulatus*. ½.

Weight 7½ to 9½ lbs. when in good condition. An old male in captivity and very fat weighed 9¾ lbs. but wild birds seldom weigh more than 8½ lbs.

In old males all the spots and the black of the upper parts are glossed with green and the bird in life looks a brilliant metallic green when in the sun. The gloss is green at the tip of each feather with a subtip of purple. The colour of the lower parts varies very much, both in depth of colouring and in the extent of the black mottling. In birds freshly moulted the colour is usually a rich red-ochre brown, the black mottlings—confined more or less to the tips of the feathers—being rather extensive. In faded plumage the lower parts are a pale dull earth-brown, with but little tinge of red and practically no black at all.

In the same way, by about July or August, the whole of the upper plumage becomes bleached and the gloss almost or quite disappears.

I think very old males become more white about the head and neck, more especially round the eye. A very fine male which was in my possession for some years became quite white for a space all round the eye and down the front of the neck.

The female does *not* differ conspicuously from the male, and birds in their first plumage are hardly distinguishable; on the whole she is not so highly coloured or quite so highly glossed, and perhaps has less black on the lower parts. The difference is, however, one only of comparison and a duck in good plumage is far more highly glossed and coloured than a male whose colours have begun to fade.

Colours of soft parts. Similar to those of the male but paler and duller; the bill is usually of a pale dull lemon, very rarely with an orange tinge and never with this tinge at all strongly developed; the black mottlings resemble those on the bill of the drake and vary to the same extent. In both sexes I have seen bills the ground-colour of which was almost obliterated by the spots and others, again, in which there were only a few small spots near the tip and base. The base of the upper mandible in the female is never swollen or red in colour. Irides are brown, never red-brown and certainly never blood-red.

Measurements. Wing 305 to 356 mm. Weight $4\frac{3}{4}$ to $6\frac{3}{4}$ lbs.

Distribution. Eastern Assam, Burma South to Tenasserim. It is rare in Western Assam but occurs occasionally on the North of the Brahmapootra in Kamrup, Goalpara and Tezpur. In Lakhimpur it is common and it straggles through to Sibsagar, Naogang and Cachar but is very rare anywhere South of the Brahmapootra. Outside Burma it extends down the Malay Peninsula to Java and Sumatra.

Nidification. The Wood-Duck probably breeds from June to August but the only egg known is the one in my collection taken on the 30th of June from a large nest of sticks and rubbish placed in a fork of a great tree where three boughs branched out from the main stem. The so-called "nest" may have been an accumulation of rubbish or the nest of some Raptore, or may have been made by the Duck. The single egg it contained was a pearly-white, intensely glossy and fine-shelled, measuring 65·0 × 48·2 mm. Birds in captivity mated in June but none of mine ever laid eggs.

Habits. This Wood-Duck is a bird of the densest forests, frequenting those which are intersected by small and large pools and swamps, and well away from human beings. As a rule they keep in small flocks of half a dozen or less but often are found singly or in pairs. They fly with considerable power and speed, swim and dive well and walk as well and more quickly than geese. Their food consists of grain, shoots and buds of land-plants, fish, frogs, worms etc. but I have never known them eat any water-weed and they will take no dead animal, fish or insect food. Their breeding-call is a very fine trumpet, audible at a great distance; in addition they have many conversational croaks and guttural noises besides making a loud hissing when annoyed. During the heat of the day they remain quiescent in the deepest shade they can find, either floating on the water or perched on the bough of a tree.

Genus **RHODONESSA.**

Rhodonessa Reichenbach, Natur. Syst. Vögel, p. ix (1852).

Type by orig. desig., *Anas caryophyllacea* Latham.

In structure this genus is intermediate between *Asarcornis* and *Anas* but differs entirely in colour and colour-pattern from any other of this family. The *bulba ossea* at the lower end of the male trachea is very peculiarly formed, being swollen on both sides and anteriorly. Sexes differ slightly in colour.

There is only one species which is confined to India and even there it is very rare.

(2249) **Rhodonessa caryophyllacea.**

The Pink-headed Duck.

Anas caryophyllacea Lath., Index Orn., ii. p. 866 (1790) (India).
Rhodonessa caryophyllacea. Blanf. & Oates, iv, p. 425.

Vernacular names. *Lal-sira*, *Golab Lal-sira* (Hind.); *Saknal* (Beng.); *Damrar*, *Dumar* (Nepal Terai and Tirhut).

Description.—Male. Whole head and neck a beautiful rose-pink except a line from the chin, gradually broadening on the fore-neck, which is blackish-brown like the upper and lower parts; the upper parts are a deeper chocolate-black than the lower and are more glossy; the mantle, scapulars, breast and flanks are finely vermiculated or speckled with rosy tips, which become abraded and are lost; edge of wing rosy-white; outer secondaries pale fawn with white tips; inner secondaries glossy green; remainder of wings chocolate-brown.

In the breeding-season there is a tuft of feathers on the crown, rather longer than the rest, which is a deeper pink.

Colours of soft parts. Iris light red or orange-red; bill dull to bright reddish-pink or deep rose-colour, darker on the ridge of the culmen and on the gonys, brighter and purer pink at the base of both mandibles; eyelids flesh-coloured; legs and feet reddish-black.

Measurements. Length about 350 mm.: wing 250 to 282 mm.; tail 106 to 131 mm.; tarsus about 40 mm.; culmen 50 to 56 mm.

Weight 1 lb. 12 oz. to 2 lb. 3 oz. (*Shillingford*).

Female. Similar to the male but with the pink of the head much less bright and more restricted in extent; brown of back, wings and underparts duller and rather paler; the dark brown line from the chin to the neck is absent or obsolete, the deep pink extending over this portion of the head.

Colours of soft parts. The same but much duller than in the male.

Measurements. Wing about 250 to 260 mm.

Young birds have the head and neck rose-white, the rest of the plumage like the female but paler.

Distribution. From Oude and Nepal to Assam and Manipur in the densest jungles running along the foot-hills of the Himalayas. Elsewhere it has appeared here and there as far West as the Punjab, from which Province there are about seven records from Rupar on the Sutlej, Gurdaspur etc. Its stronghold is probably the Duars and Eastern Bengal, though even from there it has been pushed back by increasing cultivation from places where it was once almost common.

Nidification. Shillingford is almost the only person who has taken the eggs of this lovely Duck. It breeds in dense forest and jungles, making a nest of grass and weeds in tangled undergrowth or grass close to the edge of forest pools or swamps, where humanity never enters. The eggs are unlike any other Duck in shape, being almost spherical, but they have the satin texture and intense gloss of the eggs of this subfamily. One egg in my possession taken by Shillingford measures 47·0×44·2 mm. and was taken in June 1878. Six eggs average 45·9×42·0 mm.

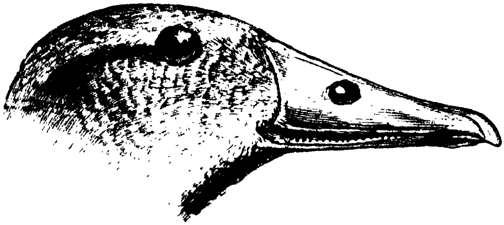

Fig. 71.—Head of *R. caryophyllacea.* $\frac{1}{2}$.

Habits. Of all our Indian Ducks this is certainly the most shy as well as secretive, so that it is seldom seen except by chance, when a line of elephants are employed to beat through thick grass or forest when hunting for tiger or big game. In former days they were not rare in parts of Eastern Bengal and sometimes half a dozen could be picked up when returning from a tiger shoot in this way. Now, however, cultivation has beaten back the jungle and driven the birds to yet remoter and less trodden jungles, where, if one could locate them, they still probably exist in some numbers. It feeds on both vegetable and animal food, remains of weeds and crustacea having been found in its stomach. Its flight is powerful and fast and its voice a musical edition of the Mallards.

Subfamily CHENONETTINÆ.

The characteristics of this subfamily are the short goose-like bill and the forward position of the feet enabling the birds to walk well and freely.

Key to Genera.

A. Head not crested in males; primaries not edged with silver-grey	NETTAPUS, p. 392.
B. Head crested; primaries edged with silver-grey.	AIX, p. 394.

Genus **NETTAPUS**.

Nettapus Brandt, Descr. Icon. Anim. Ross., p. 5 (1836).

Type by mon., *Anas aurita* Bodd.

This genus is distinguished by its short goose-like beak and small size. The bill is high at the base and narrows gradually in front; the small, oval nostrils are situated near the base; the legs are placed far back; there is a hind toe with a narrow but distinct lobe; the wings are pointed; the tail of twelve feathers is rounded. Sexes different.

(2250) **Nettapus coromandelianus.**

THE COTTON-TEAL.

Anas coromandeliana Gmelin, Syst. Nat., i, p. 522 (1789) (Coromandel).
Nettopus coromandelianus. Blanf. & Oates, iv. p. 433.

Vernacular names. *Girri, Girria, Girja* (Hind.); *Gur-gurra* (Etawah); *Gungariel, gungani* (Beng.); *Bhullia-hans* (E. Bengal); *Dan-dana* (Ooriya); *Lerriget, Perriget, Merom-derebet* (Kol.); *Ade, Atla* (Ratnagiri); *Kala-gat* (Burma); *Naher Keeke, Chuwa* (Naogang, Assam); *Baher, Kararhi* (Sind).

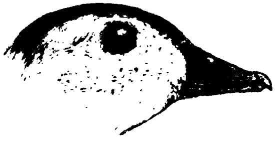

Fig. 72.—Head of *N. coromandelianus*. ½.

Description.—Adult male. Extreme point of forehead white, remainder and crown brown, the lateral edges much darker, almost black; a complete broad collar round the base of the neck black, slightly glossed with green; remainder of head, neck, lower plumage and a collar behind the black collar white; flanks most minutely stippled and more or less barred with light brown, sometimes almost absent; under tail-coverts broadly barred and tipped or subtipped brown; scapulars and back dark brown, completely overlaid with dark green gloss slightly mixed with purple; upper tail-coverts dirty white freckled with brown. Innermost secondaries brown glossed with purple, remaining secondaries glossed green and tipped with white; primaries glossy-green tipped brown and with a broad white band continuing the bar made by the white tips of the secondaries; tail brown.

Colours of soft parts. Iris bright crimson-red; bill black; legs and feet blackish, tinged on the joints and behind with slaty-yellow.

Measurements. Length about 320 mm.; wing 152 to 177 mm., generally 160 to 170 mm.; tail about 68 to 78 mm.; culmen about 21 to 24 mm.; tarsus about 25 mm. Weight between 9 and 12 oz.

Female. Cap as in the male but uniform brown; forehead more broadly speckled with brown; a deep brown line running through the eye; remainder of head and lower plumage white; the breast and lower neck with narrow bars of dark brown, taking the place of the collar in the male; face and neck much vermiculated with brown; the flanks both barred and speckled with the same. In old females the abdomen and centre of the breast are pure white; in younger birds more or less marked with brown; outer secondaries broadly and inner primaries very narrowly tipped with white; remainder of the wings, upper plumage and tail brown, the scapulars and back being occasionally faintly glossed; upper tail-coverts finely stippled with white.

Colours of soft parts. Iris red-brown; bill brown or dark olive, paler and yellowish on mandible, commissure and gape; legs and feet dull slate-yellow, more or less smudged with blackish-green; claws light yellow-brown.

Measurements. Length about 300 mm.; wing 148 to 165 mm.; culmen 20 to 22 mm. Weight about 7 to 9 oz.

Young birds are like the female, more marked about the head with brown and more banded with light brown on the flanks.

Nestling in down. A broad supercilium white; white spots on the sides of the back next the wings and others larger, on the sides of the rump; rest of upper plumage blackish-brown; flanks dark brown; sides of head, chin, throat and underparts white.

Distribution. Ceylon, India, Burma East to China and South through the Malay States to the Philippines and Celebes. In India there is no district which is not frequented or at least visited by this little Goose except such areas as are entirely devoid of water, as in Northern Sind and parts of Rajputana.

Nidification. The Cotton-Teal breeds during July, August and September, laying its eggs in holes in large trees close to water. The eggs may be laid on the bare wood or in quite big nests of twigs, grass, feathers and other rubbish. Occasionally, *fide* Blewitt, it makes a floating nest of weeds, grass etc., half supported by lotus-plants and rushes. The hollows selected in trees by the birds are seldom very high up and sometimes within a foot or two of the ground, eight to eighteen feet being the favoured heights. How the young birds are brought down to the ground is not known. A "shikari" gave me a graphic account of how he saw the young ones being carried down by the old bird but probably they are generally just pushed out by the old ones and fall like bits of light down to safety below. Once on the ground they are immediately led to water by the parents. The eggs number eight to twenty-two, generally nine or ten, and are very stout-shelled, smooth, little white eggs. One hundred eggs average 43·1 x 32·9 mm.: maxima **47·7** x 33·1 and 46·3 x **35·6** mm.; minima **38·1** x 30·3 and 41·3 x **29·7** mm.

Habits. These little Ducks are to be found wherever there is any water in more or less open country; they may be seen in the largest lakes and swamps as well as in the smallest of village ponds and ditches. In these latter they become exceedingly tame, not troubling to move until the intruder is within a few yards of them, when they dash off helter skelter, chuckling and clucking hard all the time. They associate in small flocks of half a dozen to a score of birds which sometimes collect in still larger ones. They swim high in the water, can dive well, though they seldom do so, fly at considereble speed and can walk quite well on land if not flurried. They feed on shoots of land- and water-plants, wild rice and grain and also on insects, worms, snails and small crustacea and mollusca, though these latter form quite a small percentage of their diet.

Genus **AIX**.

Aix Boie, Isis, p. 329 (1828).

Type by mon., *Anas galericulata* Linn.

In *Aix* the drake has the feathers of the fore-neck much elongated, forming a conspicuous ruff; the innermost secondary is very broad and long, pendent over the outer secondaries; the head is crested; the bill is short and the culmen nearly straight; the tarsus is short and the leg placed well forward. The genus contains two species, one Asiatic and one American, the former having occurred twice in Assam.

(2251) Aix galericulata.

THE MANDARIN-DUCK.

Anas galericulata Linn., Syst. Nat., 10th ed., i, p. 1288 (1758).

Vernacular names. None recorded.

Description.—Adult male. Supercilium from the base of the bill to the end of the crest pure white; forehead to nape glossy-green, thence the long thick crest is metallic-purple, more or less mixed with green on the basal half and either entirely green on the terminal third or sometimes shot with deep blue; face and sides of the head buff, shading into white round the eye and into cinnamon-red on the posterior cheeks, chin and throat; the neck-hackles are bright chestnut tipped with purple and with white striæ on the anterior portion; remainder of upper plumage and lesser wing-coverts dull brown glossed with bronzed green, especially on the mantle and upper tail-coverts; tail grey-brown glossed green; scapulars grey-brown, the innermost completely glossed with deep blue and the median with green, the change being graded and not clearly defined; the outermost are white with broad black edges, the innermost secondary, which is enormously broadened into a fan shape, is chestnut on the inner web, tipped paler on the outer half and with blue on the inner; on the outer web of the inner secondaries the tip is chestnut, the remainder deep glossy blue; other secondaries brown, with the outer web glossed green and tipped white, except the one next the innermost, which is all of this colour; primaries brown, glossed green and with broad edges of silver-grey on the outer webs; lower neck and sides of breast brilliant purple-copper; sides of lower breast with three bands of black and two of white; remainder of lower parts white; flank vermiculated black and brown, with copper bars opposite the vent and with black and white bars at the end of the flank-feathers; axillaries brown: under wing-coverts mixed brown and grey.

In one specimen in the British Museum the whole chin, and in another the border of the angle of the chin, is white.

Colours of soft parts. "Iris dark brown with a yellowish-white outer ring; bill reddish-brown with the nail bluish flesh-coloured; tarsus and toes reddish-yellow; membranes blackish." (*Schrenk.*)

Measurements. Wing 223 to 240 mm.; tail 108 to 122 mm.; culmen 27 to 31 mm.; tarsus 33 to 36 mm.

Adult female. Head and full crest grey, a narrow line starting above the eye and passing round the front to the back and bordering the crown white; sides of the head pale grey, grading into the white of the chin, throat and upper neck; the face is sometimes mostly white and sometimes wholly grey, whilst at other times there is a broad or narrow band of white next the bill; whole remaining upper parts and wing-coverts brown, more or less tinged with grey or olive-grey: lower neck, breast, sides and flanks the same colour as the back, each feather with a pale spot near the tip, these being very large on the flanks; remainder of lower parts white; primaries brown, slightly glossed green and broadly tipped white, two of the inner secondaries forming a deep blue-green speculum, submargined black and margined white; innermost secondaries the same colour as the back.

As with other Ducks with white underparts, these are often more or less tinged with rusty.

Colours of soft parts. As in the male.

Measurements. Wing 170 to 194 mm.; culmen 26 to 30 mm.

The male in post-nuptial plumage resembles the female, but the latter, as Oates points out, "may be separated from males . . . by the oblique white stripe which may always be found on the outer web of the first purple feather of the speculum. This stripe is just below the tips of the wing-coverts and is always absent in the male."

The young male in first plumage also resembles the female, with the exception just noted; it is, however, generally rather bigger and often more clearly coloured.

Amongst the first indications of sex plumage assumed by the young male is the deepening of the plumage of the breast and upper neck.

Nestling. Above hair-brown, the edge of the wing pale buff; two indefinite bars of the same colour on the sides, one in front and one behind the thigh; underparts wholly pale buff; a dark brown streak running from behind the eye to the neck and another from behind the ear-coverts.

Distribution. The Mandarin is a purely Eastern Asiatic Duck, being distributed throughout Central and Southern China, Formosa and Japan; Amoorland only during the breeding-season. It has also been obtained in Corea and once in Lakhimpur, Assam, by Stevens, where also six birds were seen by myself, though none were obtained. A so-called Marbled Duck shot by a planter in the same district was probably also of this species.

Nidification. This beautiful little Duck breeds in Northern China during May and June, laying its eggs in holes in trees on the banks of small streams which run through forests or well-wooded country. As might be expected of a Northern breeding Duck, the eggs are laid in a nest of grass and rubbish of all sorts well lined with thick down. The eggs are a pale fawn with a distinct gloss. Eighteen eggs of wild birds average 48·8 × 36·3 mm.: maxima **53·0 × 39·2** mm.; minima **46·0 × 34·1** mm.

Habits. The Mandarin-Duck frequents small streams and ponds in well-wooded country, associating in small flocks of about a dozen. Those in cultivated land and near towns and villages become extremely tame, whilst those in more remote districts are exceptionally wild and wary. They swim well but dive very little, fly strongly and can walk well.

Subfamily ANSERINÆ.

This subfamily contains the true Geese, which are distinguished by having a hind toe which is not lobed and in having no labyrinth or *bulba ossea* at the lower end of the trachea in the males; the tarsus is strong and reticulated throughout, the legs being placed well forward, a position which enables them to walk much better on land than do the Ducks in which the legs are placed further back. Systematists have divided the Geese up into so many genera that, if all were followed, there would be practically one species to every genus, so that the original idea of a genus, a group of species, would have no meaning. I retain all the Grey Geese and Bean-Geese, together with the Bar-headed Goose, in the one genus, *Anser*, separating the one species, *ruficollis*, into the genus *Branta*, a genus which may now be said to be universally accepted.

Key to Genera.

- A. Neck and breast white, grey or blackish, or some combination of these colours .. ANSER, p. 397.
- B. Neck and breast principally bright rufous. BRANTA, p. 407.

Genus **ANSER.**

Anser Brisson, Ornith., i, p. 58, vi, p. 361 (1760).

Type by taut., *Anas anser* Linn.

In this genus the bill is short and high at the base; the nostril is situated half-way between the base and the tip, whilst the latter is furnished with a nail-like dertrum; the tarsus is fairly long and strong; the wing is long and pointed; the tail short and rounded, containing sixteen or eighteen feathers.

In the following key several Geese are included which have not yet been *proved* to visit India, though it seems incredible that they should not do so and further material may prove that they do. The names of these Geese are placed in brackets.

Key to Species.

- A. Head with no black bands.
  - *a*. Nail of maxilla white or nearly so.
    - a^1. No white or very little white on forehead; rump grey .... *A. anser* *, p. 398.
    - b^1. A good deal of white on forehead, round base of bill; rump dark greyish-brown.
      - a^2. Wing over 15 inches .... *A. albifrons*, p. 399.
      - b^2. Wing under 15 inches........ *A. erythropus*, p. 401.
  - *b*. Nail of maxilla black or nearly so.
    - c^1. Margin of wing ashy blue-grey, upper wing-coverts light slaty-grey .... *A. brachyrhynchus*, p. 401.
    - d^1. Margin of wing and wing-coverts dark brown or blackish-brown.
      - a^2. Pale-coloured parts of bill rose-pink .... *A. neglectus*, p. 403.
      - b^2. Pale-coloured parts of bill yellow.
        - a^3. Nail less than quarter length of culmen
          - a^4. Culmen under 70 mm..... (*A. fabalis fabalis*), p. 404.
          - b^4. Culmen over 70 mm. .... *A. fabalis sibiricus*, p. 404.
        - b^3. Nail more than quarter length of culmen................ (*A. fabalis serrirostris*.)
- B. Head with two black bands .... *A. indicus*, p. 405.

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* I cannot distinguish between *A a. anser* and *A. a. rubrirostris*; the bigger the series one examines the more difficult it becomes to do so.

(2252) Anser anser.

THE GREY LAG GOOSE.

Anas anser Linn., Syst. Nat., 10th ed., i, p. 123 (1758) (Sweden).
Anser ferus. Blanf. & Oates, iv, p. 416.

Vernacular names. *Sona*, *Karria sona*, *Hans*, *Raj-hans* (Hind.); *Kallauk*, *Khar-hans* (Bhagalpur); *Mogala*, *Mogala-buttak* (Nepal Terai); *Kangnai* (Manipur); *Ngan* (Burma); *Raj-hans*, *Dhitraj* (Assam).

Description. Lower back and rump French grey; upper tail-coverts white; remainder of upper plumage, head, and neck ash-brown, the scapulars edged lighter; a very narrow white rim of feathers at the base of the bill; lower neck in front, breast and abdomen pale greyish-brown; the abdomen with more or less broad blackish spots, sometimes almost confluent, at others almost absent; remainder of lower plumage white; flanks brown, tipped pale French grey; darker grey at the bases of the feathers; shoulder of wing and smaller coverts next to it, winglet, primaries at the base and primary coverts French grey; remainder of wings brown, the secondary coverts edged whitish; under wing-coverts and axillaries French grey; two outer pairs of tail-feathers white, the central ones brown, tipped white and the others brownish at the base, changing to white at ihe tip.

Colours of soft parts. Iris brown; bill fleshy-white, pink to a livid purplish-red, the nail paler and whiter; legs and feet fleshy-pink to the same livid purplish-red; legs and bill are not necessarily of the same tinge of red or pink.

Measurements. ♂: wing 443 to 487 mm.; tail 126 to 146 mm.; tarsus about 72 to 82 mm.; culmen 55 to 70 mm.; ♀: wing 408 to 468 mm.; culmen 53 to 70 mm.

The young are far less marked underneath and the majority of birds shot in India will be found nearly white on these parts.

The Indian bird is said to differ from *Anser anser* (the Common Wild Goose) in being rather larger and with proportionately larger bill and feet, whilst the adult bird is also said to be more marked with black on the underparts. This last distinction does not hold good with most Indian specimens and a careful examination of considerable material does not substantiate the supposed differences.

Distribution. Northern Europe and Northern Asia, migrating South in Winter to India, Burma and China and on the West to Northern Africa. In India it is very common in the Nortb-West, South to Bombay. Working East it occurs in smaller numbers but is found in very large flocks on the Chilka Lake in some Winters; in Assam and Eastern Bengal it occurs regularly but in smaller flocks, whilst in Burma it is found in fluctuating numbers on all the bigger rivers and the large swamps near them.

Nidification. The Grey Lag breeds in Northern Europe, the Northern countries of the Mediterranean, through Transcaspia and Transcaucasia to Lake Baikal. It breeds in Mesopotamia, Persia, Eastern and Northern Afghanistan but has not yet been known to breed anywhere in the Himalayas. The site of the nest varies greatly. Sometimes an open marsh or tundra near lake or pond is selected, more often mossy swamp covered with small pine and birch forest and at other times, again, the interior of dense pine forest. Occasionally, in places where they are exceptionally numerous, several nests may be found close together but often there are miles of swamp between the nests. These may be fine masses of moss, bracken and rubbish with a dense lining of down, or they may be just a little moss scraped into a dry hollow with down added as the eggs are laid. The eggs number four to six or, less often, eight. Twelve and fourteen have been recorded but these must be very exceptional and probably laid by two birds. The eggs are, of course, white with an ivory tint, whilst 130 average 87·1 × 58·5 mm.: maxima **100·0** × **61·0** mm.; minima **75·0** × 55·2 and 80·0 × **54·8** mm. In the South the birds commence to lay at the end of April but in the North not until the middle and end of May, though even then the nests are sometimes surrounded by snow.

Habits. In the North-West of India, Geese begin to arrive in early October, leaving again in March, though small flocks arrive and depart much sooner and later than the main body of birds. Geese are about the most wary and hard to circumvent of all our Game-birds and it does not seem to matter whether they are shot by day or by night, by stalking or by driving, a sportsman's ingenuity is taxed to the full before he can oblain a good bag. They keep during the heat of the day to large sand-banks, where they have a far view all round and here they doze and sleep whilst a few keep on sentry duty. They feed in the evenings and often far into the night and, again, early in the mornings. Their diet is almost exclusively vegetarian and a large flock can do much damage to a growing crop of young rice or wheat. Geese walk well and fly faster than they appear to do, whilst in the water they are powerful swimmers, though poor divers. They fly in a drawn-out \/-shape, one wing of which is generally much longer than the other. Their conversational note is simply "gag-gag-gag" but they call loudly on the wing with a sonorous "honk," which can be heard at a great distance.

(2253) Anser albifrons.

THE WHITE-FRONTED GOOSE.

Branta albifrons Scop., Ann. I. Hist. Nat., p. 69 (1789) (North Italy).
Anser albifrons, Blanf. & Oates, iv, p. 417.

Vernacular names. None recorded.

Description. Forehead, from gape to gape broadly white, sometimes including the chin also; upper tail-coverts white; rest of upper parts dark brown, blackish next the forehead, ashy on the lower back; many feathers pale-edged everywhere; wing-coverts more grey-brown; greater coverts broadly edged with white forming a wing-bar; primaries dark grey tipped with black; outer secondaries black, inner like the back, tipped paler; tail-feathers dark grey tipped with white; breast and abdomen pale brown heavily blotched with black,-the latter sometimes being wholly black; feathers of the sides of breast and flanks brown with pale edges or tips; vent and under tail-coverts white.

Colours of soft parts. Iris pale brown to brown; bill flesh-colour or pale orange-yellow to rosy flesh-colour, the nail paler and whiter; legs and feet reddish flesh-colour to orange-yellow, the webs paler, claws whitish.

Measurements. Wing 393 to 431 mm.; tail 110 to 130 mm.; tarsus 60 to 72 mm.; culmen 43 to 54 mm. The female is very little smaller than the male; wing 380 to 425 mm.

Weight 4 to 6 lbs.

Young birds have the forehead blackish instead of white; there is little or no black on the breast and abdomen; the feathers of the neck are rounded instead of pointed as in the adult; the upper tail-coverts are sometimes marked with brown; the upper parts are browner and less grey.

Nestling in down. Forehead, chin, throat and sides of head and neck buffy-white, tinged ashy; above pale buffy-brown; a dark streak through the eye and a pale wing-band; lower parts greyish or yellowish-white.

Distribution. Breeds from Lapland through Northern Europe to Western Siberia. Also in Iceland. In Winter it migrates South to all Europe, Northern Africa, India, Burma and China.

Nidification. The White-fronted Goose breeds in May, June and July, either making a good nest of moss, heather and grass thickly lined with white down or, in very dry sites, just a hollow in the soil or dust lined with down. The eggs number four to seven and are of the usual ivory tint, soon becoming dirty and soiled. One hundred eggs average 78·8 × 53·2 mm.: maxima **88·5** × 56·5 and 85·0 × **59·0** mm.; minima **72·0** × 51·0 and 75·6 × **49·2** mm.

Habits. The White-fronted Goose appears in North-West India almost every year in small numbers and also across Northern India to Assam and Manipur, but everywhere rare. Williams shot one on the Chindwin and Rippon obtained it near Fort Steadman in the Shan States. In parts of Russia the flocks of these Geese collect together in vast numbers when migrating and both Brauner and Alpheraky mention having seen "tens of thousands" together. These when disturbed break up into smaller flocks. In July and August these Geese, like all others, moult their wing-quills and then, when incapable of flight, are taken in immense numbers by the Samoyeds to stew down for Winter food. Flight, voice and diet are similar to those of other geese but they are said to be very regular in daily visiting water to drink at about noon and again at about 4 P.M., when they are resting in the fields.

(2254) Anser erythropus.

THE DWARF OR LESSER WHITE-FRONTED GOOSE.

Anas erythropus Linn., Syst. Nat., 10th ed., i, p. 123 (1758) (North Sweden).
Anser erythropus. Blanf. & Oates, iv, p. 418.

Vernacular names. None recorded.

Description. Similar to the preceding bird but with much more white on the forehead, this generally running back to the eyes; on the whole also, the colour is rather richer and darker, especially on the rump, head and neck.

Colours of soft parts. Eyelids pale orange-yellow, instead of livid flesh-colour, Other parts much the same as those of *Anser albifrons.*

Measurements. Wing, ♂ 360 to 388 mm., ♀ 352 to 380 mm.; tail 95 to 109 mm.; tarsus about 58 to 62 mm.; culmen 28 to 35 mm.

Distribution. Lapland to extreme Eastern Siberia, breeding South to Turkestan, Persia etc. In Winter it is found in small numbers throughout Central and South Europe and in great numbers in Central Asia, a few birds wandering into India and South China. In India it only occurs in very small numbers but has been recorded from Sind, Cashmere, North-West Provinces, United Provinces (more frequently), Calcutta and Assam.

Nidification. Similar to that of the White-fronted Goose, but it seems to breed even earlier, Middendorf recording young with their quills starting on the 29th of July. The eggs are much smaller and, perhaps, rather a deeper ivory in tint and decidedly longer in proportion. Eighty-four eggs average 76·4 × 48·8 mm.: maxima **84·5** × 50·5 and 77·8 × **52·0** mm.; minima **69·0** × **43·0** mm.

Habits. Similar to those of *Anser albifrons*, although it seems nowhere to occur in such vast numbers as that bird. Blanford found a goose breeding in Persia which he believed to have been of this species but failed to get an adult bird, though the young ones were caught and brought in for sale in the bazaars.

(2255) Anser brachyrhynchus.

THE PINK-FOOTED GOOSE.

Anser brachyrhynchus Baillon, Mem. Soc. Alb., p. 74 (1833) (Abbeville); Blanf. & Oates, iv, p. 418.

Vernacular names. *Rhai-hans* (Oude).

Description. Generally a few white feathers on the forehead at the base of the bill; whole head, neck and upper part dark ash-brown, browner and darker on the crown; mantle and scapulars ashy grey-brown with light brown edges; centre of back and rump darker brown; sides of rump and upper tail-coverts white; some of the shorter tail-coverts sometimes brown; tail-feathers grey-brown with white tips and edges; inner wing-coverts and innermost secondaries ashy-grey; remaining wing-coverts darker ash-grey, the upper median more brown; median and greater coverts tipped whitish; primaries blackish-brown with white shafts and paler tips, the bases of the first few frosted with grey; outer secondaries blackish, narrowly edged and tipped with white; lower breast and abdomen ashy-brown, the feathers edged with whitish; flanks brown, the feathers edged with white; thigh-coverts brown, vent and under tail-coverts white; axillaries and under wing-coverts brown.

Colours of soft parts. Iris brown; nail and base of bill black, the black extending down about half the culmen, embracing irregularly the nostril and then receding to the gape, base and tip of low mandible blackish, the rest of the bill rosy flesh-colour to deep rosy-pink; legs and feet rosy flesh-colour to rosy-red.

Measurements. Wing, ♂ 435 to 458 mm., ♀ 405 to 453 mm.; tail about 121 to 152 mm.; tarsus 69 to 77 mm.; culmen, ♂ 44 to 50 mm., ♀ 40 to 45 mm. (*Witherby*).
Weight 6½ to 7¼ lbs. (*Alphéraky*).

Distribution. Breeding Spitzbergen, Franz Josef Land and, possibly, other parts of Northern Europe in the Arctic Circle. Its reported breeding in Iceland has never been confirmed beyond all doubt.

Nidification. Jourdain * says that in Spitzbergen the Pink-footed Goose "is a widely distributed summer resident, and breeds in many places on the west and north-west coasts as well as in Ice Fjord, and has been met with in Barents Land, Edge Land, and King Charles Land. The nesting-sites vary considerably; many birds breed on ledges or grassy slopes on the face of cliffs by the sea; others on great expanses of shingle in open valleys, or on slightly raised terraces in almost flat swampy valleys several miles inland. Clutches found varied from 2 to 4 in number, but Le Roi records 5, 7 and, in one case 9, evidently by two females." Fifty Spitzbergen eggs measured by Jourdain average 79·1 × 52·9 mm.: maxima **95·7** × 52·0 and 82·6 × **58·3** mm.; minima **70·8** × 49·0 and 71·3 × **48·0** mm.

The breeding-season seems to be from early June to the middle of July. Jourdain reports moulted primaries picked up as early as the 7th of July and birds in full moult and flightless on the 17th of that month. The moulting of the wing-quills never, I believe, commences until incubation is far advanced.

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* Jourdain, "On the Birds of Spitzbergen and Bear Island," Ibis, 1922, p. 165.

Habits. Similar to those of other Geese. Records of the occurrence of this goose in India are comparatively numerous but there can be little doubt that the great majority of these refer to the next bird, *Anser neglectus* or, perhaps, to some other Bean-Goose. In 1849 Blyth recorded the Pink-footed Goose in the Punjab; in 1864 Hume shot two specimens believed to have been of this species in the Jumna and Irby recorded one having been killed near Lucknow in 1858. In 1879 Hume again records it. Graham records it as "not uncommon in Assam," whilst General McLeod says that in 1853 he shot one near Gurdaspur in the Punjab. The only record, however, which applies without doubt to the Pink-footed Goose is that of the one shot by one of my collectors in the Sarrma Valley, Assam. The small bill of this specimen, 40·6 mm., is alone sufficient to show that it was not one of the bigger Bean-Geese.

(2256) **Anser neglectus.**

SUSHKIN'S GOOSE.

Anser neglectus Sushkin, Bull. B. O. C., v, p. 6 (1895) (East Russia).

Vernacular names. None recorded.

Description. This species is distinguished from *A. brachyrhynchus* by its larger size, much larger bill and by having the secondary wing-coverts blackish-brown, thus contrasting with the other coverts. From the various forms of *Anser fabalis* it is distinguished by its very bright pink feet and bill, by the slenderness and narrowness of the latter and by its darker head and neck.

Colours of soft parts. Iris brown. "Bill: nail black, base of bill black as far as the extreme edge of the nostrils, but with the edge uneven and receding slightly in the centre; band of bill a lovely carmine-pink; feet vivid fleshy red" (*Notes by Mr. N. Mundy*).

Measurements. Wing 449 to 500 mm.; tail about 135 to 160 mm.; tarsus about 74 to 80 mm.; culmen 55 to 63 mm.

Distribution. Eastern Russia and probably much of Central Eastern Europe from Hungary eastwards; through Asia Minor to Persia; Seebohm obtained it on the Yenesei, which is probably its Eastern limit.

In India three specimens were obtained by Mr. N. Mundy Dr. Moore and myself and there is little doubt it occurs in Assam not uncommonly. It is probable that the majority of the occurrences of a Pink-footed and Pink-billed Goose noted under *A. brachyrhynchus* refer to this bird, especially those from the North-West of India.

Nidification. This goose breeds on Novaya Zemlya, almost certainly also in Kolquev and probably also in the Sargai district near Urkach. Nests and eggs apparently do not differ from those of the Bean-Goose, and Sushkin, *in epistola*, tells me "it breeds East to the Obi but owing to its differences not having been appreciated, it is impossible to say much about its breeding with proper certainty."

Habits. Those of the genus.

Anser fabalis.

Anas fabalis Latham, Gen. Syn., Suppl., i, p. 297 (1787).

Type-locality: Great Britain.

The form *sibiricus*, which has been recorded from Burma, differs from the typical one in having a much larger bill and, generally, in having the head and neck strongly tinged with golden- or rufous-buff.

(2257) Anser fabalis sibiricus.

MIDDENDORF'S BEAN-GOOSE.

Melanoyx arvensis sibiricus Alphéraky, Geese, p. 104 (1905) (Taimyr).

Vernacular names. None recorded.

Description. "Head and neck grey-brown for the most part, with a strong rufous, coffee, or grey bay tint. A male from Amur-land has even a golden buff colour on the head and neck, and apparently such examples are far from being of rare occurrence locally in East Siberia, as indicated by the name, 'Yellow-headed Goose,' met with among native appellations in Transbaikalia. All these various tints are of accidental origin, and are just as often present in individuals as absent.

"In the rest of the plumage, except for a more uniform dark brown colouring on the upper surface of the body, the eastern form does not differ from the typical (*fabalis*). Even in dimensions, except, of course, the bill and feet, *M. arvensis sibiricus* almost agrees with large examples of *M. arvensis*" (=*A. fabalis*). (*Alphéraky*).

Colours of soft parts. Bill black, with a ring of yellow round the apical portion of both mandibles behind the nail. In most cases the band is narrow but in some extends to the anterior edge of the nostril.

Measurements. Wing 475 to 505 mm.; tail about 140 mm.; tarsus about 80 to 85 mm.; culmen 74 to 83 mm., the depth of the lower mandible 7 to 11 mm., occasionally 12 mm.

In typical *A. f. fabalis* the wing ranges up to about 470 mm. and the culmen is between 56 and 66 mm.

Distribution. North-Eastern Siberia, breeding on the Taimyr Peninsula, occurring West to the Lena and Lake Baikal. In Winter migrating to Japan and China and once in Burma.

Nidification. According to Alphéraky this fine Bean-Goose breeds practically everywhere in Eastern Siberia as far West as Lake Baikal. He says that it breeds alike on the lowlands and on the hills and quotes Maeek to this effect: "It builds its nest near the Vilyui and its tributaries, on lakes far removed from habitations, and young in down were found as early as June 8th."

The eggs are ivory-white, soon becoming soiled, and some taken by Taczanowsky vary in measurement between 70·6×53·2 and 90·0 ×59·0 mm. Gobel, however, gives the average of three eggs as 92·5×61·7 mm. A single egg given me by Alphéraky measures 87·5×59·1 mm. and was taken on the 20th of April.

Habits. Much the same as other geese, though it has the reputation among the natives of Siberia of being an expert diver. Its voice is said to be a hoarse repetition of that of the Common Bean-Goose.

The only specimen of this bird obtained within our limits is that recorded by Oates as having been shot at Myitkyina on the Irrawaddy.

It seems extraordinary that no other Asiatic or European Bean-Goose has yet been obtained in India and all sportsmen should keep a bright look-out for one. When shot, if the whole skin cannot be prepared, the head and bill should be sent at once to some museum for identification *together with careful notes on the soft colours.*

(2258) Anser indicus.

THE BAR-HEADED GOOSE.

Anas indica Lath., Ind. Orn., ii, p. 839 (1790) (Taimyr Peninsula).
Anser indicus. Blanf. & Oates, iv, p. 419.

Vernacular names. *Hans*, *Kareyee-hans*, *Raj-hans*, *Birwa* (Hind.); *Paria* (Nepal Terai); *Nangpa* (Ladak); *Neer-bathoo* (Coimbatore); *Bornooria-hans*, *Boga-Rajhans* (Assam); *Badi-hans* (Chittagong); *Kangnai* (Manipur); *Tau-ngan* (Burma); *Angba Karpo*, *Ang Kar* (Tibet).

Description. Head white; a black bar across the sinciput from eye to eye and a second shorter bar below on the nape; hind-neck dark brown; a streak down each side of the neck, chin and throat white; rest of neck brown; upper plumage pale ashy, each feather edged with whitish; the mantle and scapulars rather darker; lower back and rump purer grey, the sides whiter still; tail grey with a white tip; coverts and inner secondaries pale ashy, the greater coverts broadly edged with white; primaries grey, browner towards the tip; inner primaries and secondaries darker and innermost secondaries dark brown; throat white;

fore-neck ashy-brown, passing into ashy on the breast and to white on the abdomen; the vent and under tail-coverts pure white; flanks brown, the feathers more rufous towards the tips and edged with white.

Colours of soft parts. Iris dark brown or black; bill lemon-yellow to orange, generally orange-yellow, the nail black or blackish-horny, the region round the nostrils paler; legs and feet yellow to pale orange-yellow.

Measurements. Wing 406 to 482 mm.; tail 127 to 170 mm.; tarsus about 63 to 81 mm.; culmen about 47 to 63 mm.

"Weight 4 lbs. to 6 lbs. 14 ozs." (*Hume*).

Young birds have no bars on the head and no white neck-stripes; the upper part of the head is sooty-black, the forehead paler and whitish; the sides and front of the neck are dusky-grey mottled with white; the breast and abdomen are much suffused with rusty and the flanks are not barred.

Nestling in down. Above pale brown or buffy-brown, yellowish below and almost white on the abdomen.

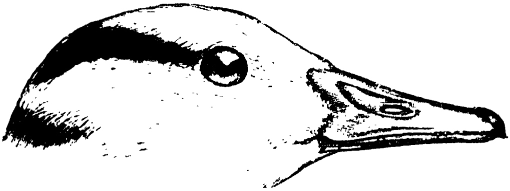

Fig. 73.—Head of *A. indicus.* $\frac{1}{2}$.

Distribution. Kashmir, Ladak, Tibet and Setchuan in Summer; migrating South in Winter to Northern India and Burma. In India it occurs in immense numbers from Sind and the North-West Provinces to Assam and is equally common on the great rivers of Northern Burma. In Central India it is still common but in the South becomes rare. It has been obtained in Mysore (*McInroy*), Coimbatore (*Theobald*), Nelliampathy (*Kinloch*) and it is common in parts of the Deccan. In Orissa it is to be found in great numbers from November, or earlier, to March on the Chilka Lake and other wide waters.

Nidification. The Bar-headed Goose breeds on the lakes of Ladak and Tibet in colonies of many thousands during June. According to the Tibetans some of the geese commence breeding in May but, on the other hand, both Steen and Kennedy took eggs as late as July. The birds breed both on the shores of the lake and on the small islands which are scattered all over the marshy land at the more shallow end of the lake. In some places many nests may be found crowded close together, whilst in others they are scattered over a wide area. Most nests are hollows in the moss and herbage on the dry islands, well lined with a mass of white down and feathers. The nests on the wetter marshes are better made and consist of a pile of moss, weeds and grass, these, also, being well lined with down. The eggs number three to six, very rarely seven or eight and are a fine ivory-white when first laid, rapidly becoming stained and dirty as incubation progresses. One hundred eggs average 84·4 × 55·1: maxima **91·6** × **60·4** mm.; minima **75·2** × 55·2 and 81·3 × **50·5** mm.

Habits. The Bar-headed Geese are almost exclusively birds of wide rivers and large open lakes and in many parts of India they arrive on these in huge flocks in October, remaining until the end of March. They are just as wary, wideawake birds as the rest of the genus and the sportsman who tries to stalk them has to use all his wits to be successful. The easiest way to get a bag is to take them as they flight to their feeding-grounds from the big rivers, where they rest by day. They are entirely, or almost entirely, vegetable feeders and the flocks do great harm to young crops, among which they graze during the night. Their voice is a sonorous and musical "honk," rather more shrill than that of the Grey Lag, uttered on the wing at short intervals, the call being replied to by other flocks as each wends its way to the same feeding-ground. Here they all collect and feed in company but again break up into flocks on their return to the rivers and lakes for the day. They fly either in wide V-shaped formation or in long lines and it is only when taking very short flights that they "bunch."

Genus **BRANTA.**

Branta Scopoli, Annus I, Nat. Hist., p. 67 (1769).

Type, *Anas bernicla* Linn.

This genus differs from *Anser* in having no serrations visible on the edge of the upper mandible. The genus extends throughout the Palæarctic and Nearctic regions.

(2259) Branta ruficollis.

THE RED-BREASTED GOOSE.

Anser ruficollis Pallas, Spicil. Zool., fasc. 6, p. 31, pl. iv (1769) (South Russia).

Vernacular names. None recorded.

Description. A round white patch between the bill and the eye; a chestnut patch surrounded by white on the ear-coverts, the white running in a band down the side of the neck; upper part of the head and hind-neck black; back and rump black; upper tail-coverts white; tail black; wing-coverts blackish-brown with pale edges, forming two broad grey wing-bands on the median and greater coverts; neck and upper breast rich chestnut;

lower breast black, running on to the abdomen ; posterior abdomen and under tail-coverts white.

Colours of soft parts. Iris hazel or brown, "chestnut" (*Witherby*); bill and legs black.

Measurements. Wing 343 to 361 mm.; tail 97 to 109 mm.; tarsus about 50 to 57 mm.; culmen 23 to 26 mm.

Young birds have the black upper parts browner and duller; the white bands are less defined, the feathers margined with blackish-brown; the breast and chestnut parts are paler and more cinnamon in tint.

Distribution. Western Siberia, migrating South after breeding to practically the whole of Europe, Central Asia and casual to North-East Africa. It winters in Persia and there is no reason why it should not be found occasionally in India. Mundy undoubtedly saw a single specimen of this goose in Assam on the Brahmapootra and a flock of five passed within about 60 yards of a steamer I was in on the same river in March 1907. A *probable* occurrence was published in the 'Oriental Sporting Magazine' in 1836.

Nidification. This goose breeds in Western Siberia, Northern Russia and Eastern Lapland. Pearson first recorded its breeding in Lapland in 1896 (Ibis, 1896, p. 210) but Finnish ornithologists have since then again taken their eggs. Middendorf obtained eggs on the Boganida on the 25th of June, Seebohm found it nesting on the Yenesei in late June in 1877, whilst Popham found other nests on the same river in 1895.

The eggs are like those of the Bean-Goose and from seven to nine seems to form the full clutch. The average of seven eggs is 66·6 × 46·0 mm.: maxima **69·5** × 46·0 and 68·5 × **48·0** mm.; minima **63·0** × **44·8** mm.

Habits. Much the same as those of other geese. They are said to fly, even when migrating, much more in mass formation than in V-shape or in lines, whilst their voice is described as shrill and squeaky compared with that of Bean-Geese or White-fronted Geese. They are also said to have a low grunting or chuckling conversational note when feeding.

Subfamily ANATINÆ.

In the subfamily *Anatinæ*, as restricted in the present work, are included the surface-feeding ducks with a hind toe furnished with a narrow lobe, the tail-feathers normal and the bill always much depressed.

As a rule the drake in this subfamily assumes by moult a nuptial plumage which is discarded for a brief period for a post-nuptial dress. In some Indian ducks it is possible that this dress is not always acquired and further evidence is still required to

elucidate this point It may eventually be found that the double moult is always undergone, even when there is no change in the plumage.

Another character found in all the drakes of this subfamily is the development of the *bulba ossea*, or labyrinth, at the base of the trachea, close to the bifurcation of the bronchi.

This *bulba ossea* is a bony, or partly bony and partly membraneous, dilatation of the lower tracheal rings and is often lateral, as in the common Wild Duck (fig. 75); sometimes, however, this expansion is medial or in two directions, the different forms being characteristic of different genera. The *bulba ossea* is not found in the other subfamilies except in the *Anserinæ*.

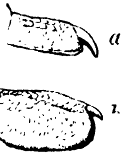

Fig. 74.—Hind toe of (a) *Dafila acuta* with narrow lobe, and (b) *Nyroca fuligula* with broad lobe. 1/1.

In the *Anatinæ* the bill is depressed and, especially near the tip, much broader than high; the legs are short, placed far back and more adapted for swimming than walking: a brightly coloured patch, known as the speculum, is often found on the exposed bases of the outer secondaries and their coverts.

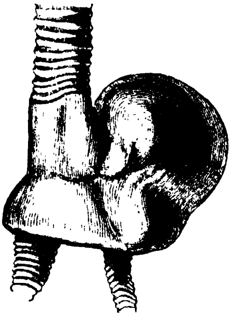

Fig. 75.—Lower trachea of *Anas platyrhyncha* with the *bulba ossea*. 1/1.

The subfamily contains twelve genera as found in India. Hartert reduces these considerably, including *Anas*, *Querquedula*, *Chaulelasmus*, *Mareca*, *Eunetta*, *Dafila* and *Marmaronetta* under the one genus, *Anas*. On the other hand, certain other systematists go so far as to split up *Anas* into even further divisions. Blanford's divisions seem simple and sufficient and I retain them in the present work.

Key to Genera.

- A. Lower portion of tarsus in front reticulated. DENDROCYGNA, p. 410.
- B. Lower portion of tarsus in front scutellated.
  - *a*. Speculum always present.
    - *a'*. Outer web of inner secondaries chestnut.
      - a^2. Coloration pied; chestnut, black and white .... TADORNA, p. 414.
      - b^2. Coloration, except quills, all chestnut of various shades .... CASARCA, p. 416.
    - *b'*. Outer webs of inner secondaries not chestnut.
      - c^2. Bill not spatulate.
        - a^3. Outer wing-coverts not grey-blue.
          - a^4. Central tail-feathers moderate in length and not elongated.
            - a^5. Bill broad and about the length of the head........ ANAS, p. 418.
            - b^5. Bill not broad and shorter than the head.
              - a^6. Tail-coverts longer than the rectrices .... EUNETTA, p. 424.
              - b^6. Tail-coverts shorter than the rectrices.
                - a^7. Central tail-feathers not acuminate and not projecting beyond the lateral .... CHAULELASMUS, p. 426.
                - b^7. Central feathers acuminnate and extending slightly beyond the lateral.
                  - a^8. Bill small and about equal in breadth throughout........ MARECA, p. 428.
                  - b^8. Bill moderate and tapering towards the tip .... NETTION, p. 431.
          - b^4. Central tail-feathers lengthened and pointed .... DAFILA, p. 437.
        - b^3. Outer wing-coverts blue or blue-grey........................ QUERQUEDULA, p. 439.
      - d^2. Bill spatulate .... SPATULA, p. 442.
  - *b*. Speculum wanting .... MARMARONETTA, p. 444.

Genus DENDROCYGNA.

Dendrocygna Swainson, Class. Birds, ii, p. 365 (1837).

Type by mon., *Anas javanica* Horsf.

In this genus the bill is of moderate size, raised at the base and of nearly the same width throughout; the nail is prominent and suddenly bent down; the nostrils are placed about one-third the length of the bill from the base; the wings are rather broad and rounded; the tail of sixteen feathers also short and rounded; the tarsus is long and stout, reticulated and the legs are placed more forward than in other genera of this subfamily; the feet are large.

The genus is represented almost throughout the tropical world, two species being found in India.

Key to Species.

A. Upper tail-coverts uniform chestnut .... *D. javanica*, p. 411.
B Upper tail-coverts whitish, sometimes marked with black .... *D. fulva*, p. 413.

(2260) Dendrocygna javanica.

THE LESSER OR COMMON WHISTLING TEAL.

Anas javanica Horsf., Trans. Linn. Soc., xiii, pl. i, p. 200 (1821) (Java).
Dendrocygna javanica. Blanf. & Oates, iv, p. 430.

Vernacular names. *Silhi*, *Silkahi* (Hind.); *Saral*, *Sharail* (Beng.); *Hansrali* (Ooria); *Sorali*, *Horali* (Assam); *Tingi* (Manipur); *Bongfang Daophlantu* (Cachari); *Verrundi* (Mal.); *Chemba Tara* (Tam., Ceylon); *Saaru*, *Tata-saaru* (Cing.); *Si-sa-li* (Burma).

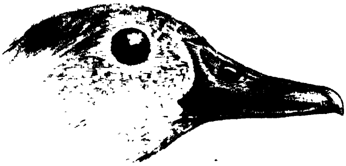

Fig. 76.—Head of *D. javanica*. ½.

Description. Forehead and crown brown, paler and reddish on the forehead and darkest on the occiput; remainder of head and neck pale fulvous-grey, paler on the cheeks and almost white on the chin and upper throat; hind-neck reddish-brown changing into brown on the scapulars and back, where the feathers are broadly margined with golden-rufous: rump black; upper tail-coverts chestnut; tail brown, very narrowly margined with pale dingy rufous; lesser and median wing-coverts chestnut, the latter sometimes mixed with ashy; greater wing-coverts dark ashy, rarely splashed with chestnut next the primaries; quills black, the inner secondaries more brown and edged with dingy ash-colour; upper breast yellowish-grey or yellowish-fulvous, this changing to chestnut on the breast and abdomen and this again into the creamy-white of the lower tail-coverts; flanks chestnut, the feathers sometimes centred paler; axillaries brown.

Colours of soft parts. Iris dark brown; bill slaty-grey to almost black, the nail still darker; eyelids bright yellow; legs and feet plumbeous-grey or plumbeous-blue, generally patched darker here and there, the webs and claws blackish.

Measurements. Length 306 to 343 mm.; wing 176 to 204 mm.; tail about 63 to 76 mm.; tarsus about 40 to 50 mm.; culmen about 43 to 56 mm.

Weight 1 lb. to 1 lb. 6 oz., the latter weight exceptional.

Young birds are everywhere more dull in colour; the margins to the feathers of the mantle are dingy fulvous instead of golden-rufous and the lower plumage is a pale dull fulvous-brown.

Nestling in down. Black; a white eyebrow and a conspicuous white patch on the back of the head; a white patch on the wings and two other white patches on each side of the lower back and rump (*Livesey*).

Distribution. Ceylon, all India, Burma, Indo-Chinese countries, the Malay Peninsula, Andamans, Sumatra, Java, Borneo, the Loochoo Islands and occasionally in China.

Nidification. The Whistling Teal commences to breed as soon as the Rains break, that is to say about the end of June and, even in Ceylon, most eggs are laid in July and August. The nest and its site vary greatly. In Rungpur and other districts of Eastern Bengal a deserted Crow's nest is the favourite receptacle for the eggs, other nests being also used from time to time. Some birds select large hollows in trees; other birds make nests of sorts in trees; others make nests of leaves, rushes and grass on cane-brakes or reed-beds in swamps, whilst yet others make a comfort able grass nest on the ground in grass and vegetation near or in swamps or, else, on the banks which divide the rice-fields from one another. I think the duck only incubates but the drake keeps close to her, sitting on a branch by the nest when this latter is in a tree and whistling softly at intervals to cheer her up. The eggs number six to eight; in the Punjab and Western India larger clutches, ten or twelve are common, whilst in Assam four or five eggs were often incubated. The eggs are very broad obtuse ovals; the texture fine and smooth, the shells thick with an inner membrane of lemon-yellow. When first laid they are an ivory-white or pure white but soon become very stained. One hundred and fifty eggs average 46·9 × 36·8 mm.: maxima **54·4** × **41 0** mm.; minima **43·7** × 35·9 and 47·3 × **35·0** mm.

Habits. Although neither of the Whistling Teals is truly migratory, both species move about a great deal under the pressure of food-supply, so that many parts of India are avoided during the height of the dry season and only visited when the water-supply assures abundant food. Where swamps and lakes abound all the year round, as in Assam and Bengal, there they are permanent residents. They associate in flocks of all sizes from a dozen to several hundred and over most of their range are extremely tame and confiding little birds but, when shot at, they soon become as wary as any other duck. They fly well but not nearly so fast as Teal or Mallard; swim as well as other ducks and are not bad divers, though they do not remain under water long. Their call is a shrill but not unmusical whistle, which they utter when on the wing and also when perching on trees, which they constantly do. Resting during the heat of the day, they usually sleep either in reed-beds or on the open water. They feed both by grazing and on snails, worms, frogs and small fish, whilst the young are fed almost entirely on small fish and reptiles. For the table it is a very doubtful delicacy; some birds are excellent, some are intolerable near the table and their condition probably depends on their diet previous to having been shot.

(2261) Dendrocygna fulva.

THE LARGE WHISTLING TEAL.

Anas fulva Gmelin, Syst. Nat., i, p. 530 (1789) (Nova Hispania).
Dendrocycna fulva. Blanf. & Oates, iv, p. 432.

Vernacular names. *Si-Sali* (Burma).

Description. Crown deep ferruginous, passing into a blackish-brown stripe on the nape; centre of neck pale rufescent-white streaked with blackish; remainder of head, neck and lower plumage ochraceous-rufous changing to cinnamon on the flanks. which are streaked with pale ochraceous and dusky; above brownish-black, each feather broadly edged with cinnamon-rufous median and lesser wing-coverts chestnut; remainder of wing black; rump and tail black or deep brown; vent, upper and lower tail-coverts rufescent-white.

Colours of soft parts. Iris light to dark brown; bill dusky-black, nearly always more or less marked with bluish-slate at the base, this colour sometimes occupying nearly three-quarters of the upper mandible; legs and feet vary from pale dusky-plumbeous or bluish-slate to nearly black; claws black.

Measurements. Wing, ♂ 205 to 236 mm., ♀ 198 to 212 mm.; tail 52 to 57 mm.; tarsus about 53 to 57 mm.; culmen about 42 to 52 mm.

Weight, ♂ 1 lb. 8 oz. to 2 lbs., ♀ 1 lb. to 1 lb. 10 oz.

Young birds are duller in colour; the chestnut of the wing-coverts is more brown and the upper tail-coverts are edged with brown.

Nestling in down. Upper parts greyish-brown; a white band across the occiput, broken by a darker brown band down the nape and hind-neck; a brown band from the eyes to the nape; underparts buffy-white.

Distribution. Africa, from Lake Tchad and the Sudan South to Lake Ngami and Natal, Madagascar, South-West United States, Argentina, India, Burma and the Indo-Chinese countries. In India it is common in parts of Eastern Bengal and the Deccan; it is not rare in Assam and extends through Manipur into Northern

Burma and again becomes more common in Pegu. Elsewhere in India it is scattered very sparsely throughout the North and North-West.

Nidification. The Large Whistling Teal breeds in some numbers in Eastern Bengal, generally building a nest of twigs, roots and water-weeds on small trees growing in swamps. Sometimes the nests of other birds are appropriated and sometimes the eggs are laid in hollows in trees. In India these birds have not been observed to nest on the ground but quite possibly may do so. They breed throughout the rainy weather, most eggs being laid in August. Fifty eggs average 56·6 × 42·9 mm.: maxima **60·9** × **51·0** mm.; minima **45·3** × 38·1 and 47·3 × **38·0** mm.

Habits. The Larger Whistling Teal is a more shy bird than the preceding and never haunts village ponds and ditches. They are stronger fliers, even better walkers but worse divers than their smaller cousins, whilst they generally associate in much smaller flocks. Their whistle is like that of *D. javanica* but louder and higher pitched. Both this and the preceding species are very easy to domesticate and are very hardy little birds in captivity.

Genus TADORNA.

Tadorna Fleming, Philos. Zool., ii, p. 260 (1822).

Type by taut., *Anas tadorna* Linn.

In the genus *Tadorna* the bill is short, high at the base, concave above, the tip flattened and turned up, the nail small and abruptly turned downwards and inwards; the males have a fleshy knob at the base of the bill which is larger in the breeding-season; the nostrils are less than one-third the length of the bill from the base; the tarsus is scutellated in front near the foot; the wings are long and pointed; the tail of fourteen feathers is rounded.

Sexes alike, the female slightly duller only.

(2262) Tadorna tadorna.

THE SHELDRAKE.

Anas tadorna Linn., Syst. Nat., 10th ed., i, p. 122 (1758) (Sweden).
Tadorna cornuta. Blanf. & Oates, iv, p. 427.

Vernacular names. *Shah-chukwa*, *Saféd-Surkhab*, *Rararia* (Hind.); *Thar-jo-niraji*, *Niraji* (Sind).

Description. Head, upper neck and scapulars black, the first two richly glossed with green; longer inner secondaries chestnut; a chestnut band including the back, the sides in front of the wing and across the breast; primaries blackish-brown; outer secondaries brown with a rich green speculum; a black or dark brown band along the centre of the breast and abdomen; under tail-coverts rufous; tip of tail black; the remainder of the plumage white.

Colours of soft parts. *Iris brown; bill deep fleshy-red to coral-red, the nail darker and brownish; legs and feet fleshy-pink to fleshy-red, claws black.*

Measurements. Wing, ♂ 318 to 350 mm., ♀ 290 to 334 mm.; tail 108 to 125 mm.; tarsus about 50 to 58 mm.; culmen, ♂ 52 to 60 mm. with a large fleshy knob about 20 mm. high; ♀ 43 to 55 mm. with no knob.

Male in eclipse plumage has the head dull blackish with little gloss and pale exposed bases to the feathers; the feathers of the mantle are tawny with black tips; the black band upon the lower plumage has each feather tipped white.

Female similar to the male but duller and with the chestnut feathers edged with black vermiculations.

Young birds have the head and neck dull blackish, the feathers edged pale brown; interscapulars dark brown; there is no chestnut breast-band, though sometimes the sides are slightly suffused with chestnut.

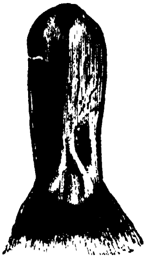

Fig. 77.—Head of *T. cornuta.* ½.

Nestling. Above dark brown; the forehead, lores and obsolete supercilium white; a white patch on the interscapulars; below white, a brown patch on the thighs and a broad brown bar on the wings.

Distribution. Northern Europe to France and Spain; South Siberia and Central Asia. On migration South to Northern Africa, India, Burma, Japan, China and Formosa. In India it only occurs casually every Winter, very severe cold driving the birds further South than in mild seasons. It probably occurs every year in Sind, Punjab, North-West Provinces and Oude and more rarely South to Neemuch, Poona, Deccan etc., East it occurs in Assam and Eastern Begal and Behar. In Burma it is rare but has been obtained in Arrakan, Shan States etc.

Nidification. The Sheldduck breeds during April and May, though a few may lay early in June. The eggs are deposited in a rabbit furrow or some similar hole and, where these are not available, in a natural crevice or hollow in banks and cliffs. The down is exceptionally luxuriant, forming a dense, soft white bed, wherever the site may be. The eggs number eight to sixteen and are a most beautiful pearly-white when first laid and, though as incubation proceeds they lose the wonderful lustre, they do not get so stained as do most ducks' eggs. The duck sits all day, the drake taking her place in the mornings and evenings when she feeds. The rabbit-holes selected are often in sand-banks with steep sides and the birds fly into these with wonderful dexterity, though, when the entrances are on flatter ground, they generally alight and walk into the holes. One hundred eggs average 65·7 × 47·3 mm.: maxima **70·0**×47·3 and 69·0 × **50·0** mm.; minima **61·1**×48·0 and 62·8×**43·3** mm.

Habits. The Sheldrake is a sea duck rather than a bird of rivers and lakes and it is therefore only seen in India as it passes South to the sea-coasts. The few which do content themselves with fresh water frequent only such pieces as have large clean areas and sandy banks upon which they can walk and rest. They feed principally on small mollusca and crustacea, water insects and such other animal food as they can pick up at low tide. They fly well, walk well and swim high and strongly but are poor divers. Their call is a loud, rather musical "kor-kor-korra," the duck's voice being more of a quack, though loud and resonant, whilst, in Spring, the male is said to have a low, clear whistle.

Genus CASARCA.

Casarca Bonaparte, Comp. Geog. List Birds Eur. & N. Am., p. 56 (1838).

Type by mon., *Anas ferruginea* Vroeg.

The genus *Casarca* is very close to *Tadorna*, in which it is included by some systematists. It differs in its straighter bill, which is less hooked at the tip; the tail is short, rounded and of fourteen feathers as in *Tadorna*. The sexes differ very slightly. Both sexes have a rudimentary spur on the carpal joint. One species occurs in India.

(2263) Casarca ferruginea.

THE RUDDY SHELDRAKE OR BRAHMINY DUCK.

Anas ferruginea Vroeg, Cat. d'Ois., Adum., p. 5 (1764) (Tartary).
Casarca rutila. Blanf. & Oates, iv, p. 428.

Vernacular names. *Chakwa* ♂, *Chakwi* ♀, *Sarkhdh*, *Lâl* (Hind.); *Mungh*, *Lalo* (Sind); *Bugri* (Beng.); *Sarza*, *Chakrawâk* (Mahr.); *Bapana*, *Chilluwa* (Tel.); *Kesar pandia*, *Panda Hansa* (Ooriya); *Nir-batha*, *Nir-koli* (S. India); *Hintha* (Burma); *Ramkaon*, *Chakoi-Chakoua* (Assam); *Kwancha*, *Kathiun* (Manchar).

Description.—Male. Whole head and upper part of the neck buff, changing gradually into bright orange-brown at the base of the latter; scapulars, back, flanks and the whole lower plumage rather bright orange-brown; lower back finely vermiculated black and rufous; upper tail-coverts and tail black; wing-coverts white; quills black; secondaries glossed rich green on the outer webs, forming a well defined speculum; inner secondaries light buff, more or less tinged with rufous on the outer web and principally grey on the inner; axillaries and under wing-coverts white.

In the breeding-season there is a black collar at the base of the neck, obsolete or entirely wanting in our Indian Winter visitors.

Colours of soft parts. Iris rich brown; bill and feet black.

Measurements. Wing, ♂ 360 to 394 mm., ♀ 310 to 356 mm.; tail about 130 to 140 mm.; tarsus about 63 to 74 mm.; culmen, ♂ about 58 to 68 mm., ♀ about 54 to 60 mm.

The female has no black collar; the head is paler and the whole of the back of the head white.

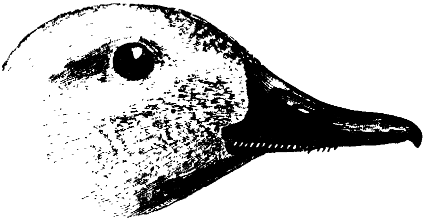

Fig. 78.—Head of *C. ferruginea.* ½.

Young birds are like the female but duller; the scapulars and whole back are vermiculated brown and pale rufous; inner secondaries brown vermiculated with reddish-buff; tail narrowly barred and tipped with rufous; lower plumage with obsolete pale tips to each feather.

Nestling in down. "White, marked on the upper surface with blackish-brown and with here and there a fulvous tinge" (*Hume*).

Distribution. Spain, the Mediterranean countries, Asia Minor, Turkestan, Afghanistan, Himalayas, Northern China to Japan. In Winter South to India, Ceylon, Burma, South China and Formosa. It is rare in the extreme South of India and also in Burma South of Pegu.

Nidification. The Ruddy Sheldrake breeds during late May, June and July, normally laying its eggs in the deserted burrow of some animal, which it lines with a thick bed of down, not distinguishable from the down of the Common Sheldrake, though the feathers intermixed with it are easily recognized. In Tibet and Ladak it breeds in holes in cliffs and sometimes in holes in buildings, even when these are occupied. At other times it takes possession of the deserted cliff-nests of other birds, such as those of the Raven, *Neophron*, Black Kite etc. Often the nest is placed at a great distance from water but the old birds, after tumbling the youngsters headlong out of the nest, lead them down to it very shortly after they are hatched. The eggs are of the same lovely pearly-white as those of the Shelduck and are equally smooth and finely textured. The number of eggs laid varies greatly but probably six to ten forms a normal clutch. Eighty-five eggs average 67·0 × 47·0 mm.: maxima 72·0 × 49·0 and 68·8 × 49·5 mm.; minima 61·5 × 45·6 and 65·0 × 45·0 mm.

Habits. The Brahminy Ducks arrive in and depart from India in flocks which in the intervening months break up into pairs. They are birds of clean water and wide stretches of sand-bank, keeping almost entirely to the larger rivers and it is only when there are none of these that they resort to lakes and ponds. They are among the most wily and wideawake of birds and, though they are worthless for the table, provide splendid practice in stalking. Their notes are syllabified by their name "Chakwa" and "Chakwi" and a legend relates how the birds are the souls of two sinning lovers who never meet, yet call endlessly to one another "Chakwa, may I come?" "No Chakwi"; "Chakwi, may I come?" "No Chakwa." These ducks are omnivorous in their diet; they graze like geese, eat all sorts of grain, insects, crustacea, mollusca, fish, reptiles etc. and are said even to eat the flesh of dead human bodies. They walk and swim well but seldom dive even when wounded; their flight is leisurely in appearance like that of geese, but faster than it seems to be.

Genus ANAS.

Anas Linn., Syst. Nat., 10th ed., i, p. 122 (1758).

Type by mon., *Anas platyrhyncha* Linn.

In *Anas* the bill is broad, though not spatulate, and about equal to the head in length, the sides parallel throughout; the nostril is situated about a quarter the length of the bill from the base; the wings are long and pointed and there is a speculum on the base of the outer secondaries; the tail of eighteen or twenty feathers is moderate and rather pointed; the tarsus is shielded in front and the hind toe has a narrow lobe; the legs are placed rather far back but all the species of this genus can walk well and freely.

The genus is cosmopolitan and is represented in India by two species.

Key to Species.

A. Sexes different; speculum purple-blue; no white on outer webs of inner secondaries	*A. platyrhyncha*, p. 419.
B. Sexes alike; speculum green; outer webs of inner secondaries more or less white.	*A. pœcilorhyncha*, p. 420.

(2264) Anas platyrhyncha.

THE MALLARD.

Anas platyrhynchos Linn., Syst. Nat., 10th ed., i, p. 125 (1758) (Sweden).
Anas boscas. Blanf. & Oates, iv, p. 435.

Vernacular names. *Nilsir*, *Nir-rugi* (Hind.); *Lilg* ♂, *Lilgahi* ♀ (Nepal); *Amrolia Hans*, *Bonaria Pati Hans* (Assam); *Nearge*, *Nirage* ♂, *Nirajiani* ♀ (Sind).

Description.—Male. Head and upper neck bright and very glossy dark green, a ring round neck, interrupted on the nape, pure white; upper back and scapulars brownish-grey changing into dark brown on the lower neck; upper back vermiculated with dark brown; rump, upper tail-coverts and four central rectrices deep black; outer rectrices light grey edged with white; wing-coverts dark grey or grey-brown, the greater coverts tipped black and sub-tipped white, forming two distinct wing-bars; speculum glossy bluish-purple or violet; above the speculum two bars formed by the black tips and white sub-tips of the outer secondaries; exposed inner secondaries and primaries dark brown; upper breast chestnut; lower breast, flanks and abdomen greyish-white, very finely barred with dark brown; under tail-coverts velvety-black.

Colours of soft parts. Iris brown; bill dull olive-yellow, olive or dingy green, the nail black and the base and gape generally more yellow or even orange; legs and feet orange-yellow to coral-red; claws black.

Measurements. Wing, ♂ 266 to 292 mm., ♀ 232 to 276 mm.; tail 80 to 97 mm.; tarsus about 40 to 45 mm.; culmen, ♂ 50 to 57 mm., ♀ 44 to 55 mm.

Female. Chin and throat pale buff; remainder of upper and lower parts dark brown with buff edges; on the breast and abdomen the dark centres are reduced to streaks; tail-feathers brown edged with pale buff; wings as in the male.

The depth of the brown and its tint vary much, as does the boldness of the edging; in some birds the centre and edges blend together, whilst in others they contrast sharply.

Male in eclipse plumage resembles female but has the head much darker and the upper plumage back to tail much the same as in breeding plumage. The curly tail-feathers are moulted.

Nestling in down. Upper parts dark brown; whitish or pale buff patches on the wings and sides of the back and rump; a short buff supercilium and a dark streak through the eye; a dark spot behind the ear; throat buffy-white, lower parts pale brown.

Distribution. Europe, Azores, North Africa and North and Central Asia to Japan, breeding as far South as the Himalayas. In Winter it migrates South to the Canaries, Central Africa, India, South China etc. It breeds also in North America and winters as far South as Mexico and Panama.

In India the Mallard is very common in Kashmir, Sind, Punjab and the North-West, thence becoming less common Southwards but extending to Rajputana, Central Provinces and Bombay. Towards the East it is met with frequently in the United Provinces and Assam, less commonly in Eastern Bengal and Orissa and is rare in Burma.

Nidification. The Mallard breeds in great numbers in the Himalayas from 5,000 feet upwards and is extremely common on the Kashmir Lakes. The nest is a well-made affair of grass, reeds and water-weeds lined with down, sometimes in masses, sometimes quite sparse. It is invariably placed in cover and well concealed but the cover may be dense reeds in a swamp, long grass beside some ditch or pond, or even rank meadow-grass in damp fields some distance from water. The eggs number eight to fourteen and in colour range from pale greyish-green or yellowish-buff to creamy *café au lait*, the grey-green tint being much the most common. One hundred eggs taken in India average 56·6 × 40·3 mm.: maxima **60·1** × 42·3 and 59·9 × **43·0** mm.; minima **50·1** × 38·7 and 52·1 × **37·0** mm.

Mallards are early breeders, some birds in temperate Europe laying in the last week in February, though most birds lay in April. The duck sits close and generally flounders off the nest at the last moment only, if the eggs are at all incubated.

Habits. Mallards are usually found in India in small flocks of a dozen to twenty, though in Sind and Kashmir flocks of over a hundred may be seen. They frequent not only large lakes and swamps but also tiny rivulets, ponds and ditches but they possibly prefer large open pieces of water surrounded by reeds and other cover. They are fine fliers and grand sporting birds but, though they swim strongly, they are not good divers and seldom, if ever, feed by diving. On the other hand, like certain other non-diving ducks, they often feed by standing on their heads in shallow water with only the tail halves of their bodies sticking out. They are largely vegetarians in their diet but also eat mollusca, crustacea, frogs, worms, larvæ etc., whilst for the table they are among the best of their tribe. The voice of the drake is a guttural murmur but when startled he quacks also, though never so loudly as the female.

Anas pœcilorhyncha.

Key to Subspecies.

A. A broad white band posterior to the speculum.	
a. A red spot on each side of the base of the bill	*A. p. pœcilorhyncha*, p. 421.
b. No red spots on the bill	*A. p. haringtoni*, p. 423.
B. No white band posterior to the speculum	*A. p. zonorhyncha*, p. 422.

(2265) Anas pœcilorhyncha pœcilorhyncha.

THE SPOTBILL OR GREY DUCK.

Anas pœcilorhyncha Forster, Indian Zool., p. 23, pl. xiii, fig. 1 (1781) (Ceylon); Blanf. & Oates, iv, p. 436.

Vernacular names. *Garm-pai*, *Gugral* (Hind.); *Hunjur*, *Hunghur* (Sind); *Naddun* (Nepal Terai); *Kara* (Manipur); *Bor-Mughihans* (Assam).

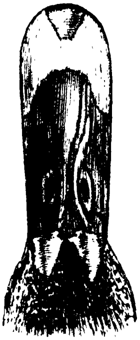

Fig. 79.—*A. p. pœcilorhyncha.*

Description. Crown from forehead to nape dark brown; a streak of the same colour covering the lores, running through the eye to the back of the ear-coverts; remainder of head and neck buffy-white, the feathers more or less centred dusky except on the chin and throat; upper parts brown to brownish-black; scapulars paler and edged with pale brown, as are some of the feathers of the back; rump and upper tail-coverts deeper brown; tail still darker and glossy, the feathers edged with pale brown; lesser and median wing-coverts grey; greater coverts dark grey sub-tipped with white and tipped black; speculum glossy green, bordered on each side with black; secondaries tipped white and inner secondaries with the outer webs broadly white; remainder of wing brown; upper breast fulvous-white, spotted with brown; abdomen darker and browner and the under tail-coverts almost black. The amount of white on the inner secondaries varies considerably as does the depth of colour on the lower parts; the breast is sometimes almost white, whilst at other times the whole of the breast and abdomen are uniform pale brown.

Colours of soft parts. Iris light to dark brown; bill black, the terminal third or less yellow to orange-yellow or orange, tipped black; a spot at the base of the bill on each side of the forehead orange-red to coral-red; legs and feet deep coral-red, claws black.

Measurements. Wing, ♂ 263 to 282 mm., ♀ 250 to 268 mm.;

tail 120 to 147 mm.; tarsus about 22 to 25 mm.; culmen about 61 to 68 mm.

Weight, ♂ 2¼ to 3½ lbs., ♀ 1¾ to 3 lbs.

Young birds are like the adult but have no red spots at the base of the bill and the feet are orange to brick-red; the general plumage is rather lighter and the spots on the lower plumage sparse or obsolete.

There is apparently no eclipse plumage in the male, though he undergoes a moult in August and September and both sexes shed all their quills simultaneously after the breeding-season.

Distribution. This duck is resident throughout India from Sind and the North-West to Ceylon and Western Assam, Cachar and Sylhet. It has been recorded from Kashmir.

Nidification. The Spotbill breeds during July, August and September over the greater part of its habitat but it also seems to breed at odd times throughout the year. In Eastern Bengal I have seen young in April, fresh eggs in August and tiny ducklings in January. Whitehead also saw ducklings during November in Sehore, whilst in Southern India November and December are probably the normal breeding months. The nest is very like that of the Mallard, a large structure of grass, weeds and rubbish placed in among thick grass or herbage near swamps and ponds. Unlike the Mallard, however, this duck provides but little down as a lining for the nest, doubtless because it is unnecessary in a warm climate. The eggs number six to twelve and are like those of the Mallard but more grey-buff in tint and less grey-green. One hundred eggs average 56·0 × 42·3 mm.: maxima 60·1 × 42·2 and 56·2 × 44·0 mm.; minima 50·0 × 38·1 and 52·1 × 37·0 mm.

Habits. This is our most widespread of resident ducks but is rather capricious in its tastes and some places which appear admirably suited do not attract it. It is common in Central India but by no means plentiful in the duck paradise of Eastern Bengal. It is very common in Manipur, quite rare in the adjoining and much wetter districts of Cachar. It frequents both large lakes and swamps and quite small ponds, preferring the latter. Rivers it avoids but it is common on the vast swamps of Mymensingh. It flies, swims and feeds in the same manner as the Mallard and the voice also is the same. It is not a very sociable bird and associates in small flocks of a dozen or less.

(2266) Anas pœcilorhyncha zonorhyncha.

THE EASTERN GREY DUCK.

Anas zonorhyncha Swinhoe, Ibis, 1866, p. 394 (Ningpo, China).

Vernacular names. *Taw-bé* (Burma).

Description. Differs from the preceding bird in never having red spots at the base of the bill and in having the speculum blue and not green as it is in that bird; the white on the outer secondaries is much less in extent, sometimes absent altogether; generally in the Eastern Grey Duck the chin and throat are a purer white and contrast more strongly with the rest of the underparts, which are darker; the white supercilium seems more conspicuous in the Eastern than in the Western bird.

Colours of soft parts the same as in the preceding bird but with no red spots at the base of the bill.

Measurements a little smaller than in the Indian Grey Duck. Wing, ♂ 254 to 276 mm., ♀ 243 to 260 mm.; culmen 56 to 63 mm.

Distribution. Transbaikalia, Eastern Siberia and Mongolia to Japan (Yezzo and Riu-kiu) and Northern China. In Winter this duck moves South to Cochin China, Yunnan and South China. There is one specimen from Kentung, Southern Shan States, in the British Museum collection, whilst Harington also shot one at Taungyi, Burma, in December 1911.

Nidification. Styan and La Touche record these ducks as breeding in Foochow and on the Yangtse in May, June and July, making their nests in the low bushes and rank grasses in which they were well hidden. In Japan they breed from April to July, making, according to Owston, a fairly compact and well-built nest like that of the Mallard, well lined with down. They seem to lay six to ten eggs, which are indistinguishable from those of the Indian Grey Duck. Forty-four eggs average 55·5 × 41·6 mm.: maxima **57·3** × 41·0 and 55·5 × **43·6** mm.; minima **51·1** × **39·7** mm.

Habits. Similar to those of the other Grey Ducks except for the fact that it is truly migratory and that it haunts sea-coasts as well as inland waters. According to Gee and Moffatt the Eastern Grey Duck is easily domesticated and interbreeds freely with the domestic duck.

(2267) Anas pœcilorhyncha haringtoni.

THE BURMESE GREY DUCK.

Polionetta haringtoni Oates, Jour. Bom. Nat. Hist. Soc., xvii, p. 558 (1907) (Shan States).

Vernacular names. *Bor-mughi-hans* (Assam), *Vum-be*, *Taw-bê* (Burma).

Description. Differs from the Indian Grey Duck in having no red spots on the base of the bill, or only very faint traces of them; the speculum is green as in that bird but the underparts are less spotted and generally paler.

Colours of soft parts as in the Eastern race.

Measurements. Wing, ♂ 245 to 268 mm., ♀ 237 to 258 mm.; culmen 49 to 57 mm.

Distribution. The whole of Burma, including Shan States, Chin Hills etc.; Yunnan, Cochin China and the extreme East of Assam. Stevens obtained many of these ducks in North Lakhimpur; Moore and Mundy got several in Dibrugarh each year from 1902 to 1905. I obtained my first specimens in the same district in 1903 and others each year subsequently until I left.

Nidification. Two nests taken in Dibrugarh were built in among scrub-jungle on the borders of a swamp; one, found on the 6th of February, containing three fresh eggs and one, taken on the 13th of April, a single fresh egg. Harington found this duck breeding in the Southern Shan States in the middle of June. The eggs are like those of the Mallard, a very pale dull buff, seven of them averaging in size 55·9 × 39·8 mm.

In the nest found in February there was a little down as lining, the nest itself being of grass and reeds and well made. In the other nests there was no down at all.

Habits. Similar to those of the Indian Grey Duck.

Genus EUNETTA.

Eunetta Bonaparte, Comp. Rend. Acad. Sci. Paris, xliii, p. 650 (1856).

Type by orig. desig., *Anas falcata* Georgi.

In this genus the upper and lower tail-coverts in both sexes are very long, extending beyond the tips of the rectrices.

In the male there is a thick, bushy nuchal crest and the innermost secondaries are greatly lengthened and sickle-shaped; the tail is of fourteen feathers.

The genus contains but one species, which is a frequent straggler into India.

(2268) Eunetta falcata.

THE CRESTED OR FALCATED TEAL.

Anas falcata Georgi, Bemerk., Reise Russ. Reich, i, p. 167 (1775) (Asiatic Russia).
Eunetta falcata. Blanf. & Oates, iv, p. 438.

Vernacular names. *Kala Sinkur* (Oude, *teste* Reid).

Description.—Adult male. Crown, lores and cheeks chestnut sides of the head below the eye bronze, becoming green on the nape and long bushy crest; mantle grey with narrow crescentric bands of black; rump brownish-black, upper tail-coverts grey vermiculated with black, the longest wholly black; tail-feathers grey, edged with whitish; a black patch on the outer scapulars; wing-coverts pale grey, the greater edged with whitish; wing-speculum glossy green, followed by a narrow band of white formed by the tips of the secondaries; primaries and outer secondaries dark grey, blackish towards the tips; inner secondaries very long, narrow and sickle-shaped, the shafts white, the webs glossy, velvety-black edged with grey; upper breast buff or whitish, with numerous crescentic bands of black, which become bars on the lower breast; abdomen and flanks barred narrowly with black and grey; under tail-coverts velvety-black; a patch of buff on each side of the under tail-coverts, the black bases of their feathers showing as a black bar; tips of posterior flank-feathers white, forming a second distinct patch; axillaries white.

Colours of soft parts. Iris dark brown: bill black; legs and feet drab, olive-grey, or olive-brown, the webs and toes black.

Measurements. Wing 246 to 257 mm.; tail about 77 to 84 mm.; tarsus about 35 to 40 mm.; culmen 43 to 47 mm.

Female. Head and neck dark brown streaked with white, the chin, cheeks and throat paler; mantle dark brown with crescentic bands of pale rufous; lower back and rump blackish-brown; upper tail-coverts brown with crescentic bands of pale rufous; tail brown; speculum black, slightly glossed with green; wing-coverts greyish-brown with white edges, most conspicuous on the greater coverts; upper breast and flanks dull rufous barred with dark brown; abdomen nearly white, lightly barred or spotted with brown; under tail-coverts rufescent, marked with dark brown.

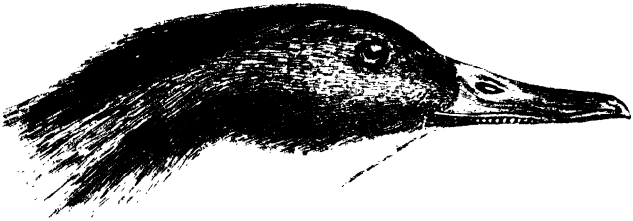

Fig. 80.—Head of *E. falcata*. ½.

Colours of soft parts as in the male.

Measurements. Wing 243 to 251 mm.; culmen about 40 to 43 mm.

The female Gadwall and female Crested Teal are very much alike but the former has sixteen restrices instead of fourteen. In fresh specimens the feet of the former are yellowish, a tint never seen in the latter; in the Gadwall the entire visible portions of the inner secondaries are pure white, in the Bronze-capped, or Crested, Teal they are black with white edges.

Distribution. Eastern Siberia, Manchuria and Mongolia to Japan. In Winter it is found throughout China and Japan, the Indo-Chinese countries, rarely in Burma, the Shan States and, even more rarely, in India.

Nidification. The Falcated Teal breeds throughout Eastern Siberia as far West as Lake Baikal; it is not uncommon on the Amur and Middendorf says it breeds plentifully on the Stanaway Mountains, almost to the top of the ranges. Owston found it common in parts of Manchuria and took many nests in Sakhalin. He describes these nests as well-made cups of grass, rushes and reed, compactly put together and well lined with down. They were placed in beds of sedges, in thick tufts of grass or, more rarely, among bushes. They were not carefully hidden and, except for the treacherous nature of the ground where they were placed, were not hard to find. The eggs number six to nine and are all very pale buff or *café au lait*, never quite white. One hundred eggs average 56·2×39·1 mm.: maxima **58·0**×39·0 and 57·0×**42·2** mm.; minima **51·1**×41·0 and 57·0×**37·7** mm.

These Teal breed from the end of April to the middle of June.

Habits. The Falcated Teal is not a very sociable bird, collecting, as a rule, in small flocks of not more than about twenty birds, whilst in India it occurs either singly or in pairs, sometimes in company with other ducks. Most of our Indian records refer to males in full or semi-plumage and it is very probable that the females generally are overlooked. In flight this duck is said to closely resemble the Common Teal, the "swish swish" of their wings overhead not being distinguishable from the noise made by that bird on the wing. Its voice, however, which is described by Prjevalski as a loud, piercing whistle, soon proclaims the bird uttering it. Whilst swimming about it gives vent to a note very like the low chuckling of the drake Mallard. Its diet is mainly vegetarian but very little has been recorded about it.

Genus CHAULELASMUS.

Chaulelasmus Bonaparte, Comp. Geog. List B. of Eur. and N. Am., p. 56 (1838).

Type, *Anas strepera* Linn.

In this genus the bill is smaller than in *Anas* and the lamellæ more developed; the tail is of sixteen feathers; the speculum is quite different, being of black and white only, glossy but with no green, blue or purple reflections. As in Ducks, colour-pattern is probably a character of considerable importance it suffices, together with the other small differences, to maintain the separation of this genus.

(2269) Chaulelasmus streperus.

THE GADWALL.

Anas strepera Linn., Syst. Nat., 10th ed., i, p. 125 (1758) (Sweden).
Chaulelasmus streperus. Blanf. & Oates, iv, p. 440.

Vernacular names. *Mila*, *Bhuar*, *Beykhur* (Hind.); *Peing-hans* (Beng.); *Mail* (Nepal); *Burd*, *Buari*, *Buhar* (Sind); *Saru-mugi-hans* (Assam).

Description. Head and neck whitish, rufous-white or dull rufous, densely speckled with brown, except on the chin, which is almost pure white in highly-plumaged birds; the anterior portions of the head nearly always darker than the posterior in ground-colour; lower neck, back and scapulars blackish-brown to rufous-brown, each feather vermiculated with wavy crescentic lines of white; lower back darker with fewer vermiculations, sometimes obsolete; rump and upper tail-coverts black; central rectrices grey, outer ones rufous-grey with whitish edges; broadest on the outermost; smallest wing-coverts like the scapulars; median and primary greater coverts chestnut, the bases brown and white and sometimes showing; greater coverts next the secondaries black; secondaries pure grey, silvery near the tips; the outer secondaries form a speculum, four or five glossy velvety-black and three with broad white outer webs, those next the black often having a narrow black edge; primaries brown-grey, darkest at the tips; shoulder of wing and under wing-coverts white; breast, sides of body and flanks like the back, the breast more boldly marked with the light and dark bars and the vent and flanks more finely marked; abdomen white; under tail-coverts velvety-black, sometimes splashed with patches of black and white vermiculations.

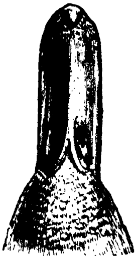

Fig. 81.—Bill of *C. streperus*. ½.

Colours of soft parts. Iris dark brown; upper mandible dark slaty-brown, black or brown; lower mandible paler and yellowish or reddish underneath; legs yellow, brownish-yellow to dull orange, claws black.

Measurements. Wing, ♂ 270 to 285 mm., ♀ 220 to 256 mm.; tail about 82 to 98 mm.; tarsus about 36 to 40 mm.; culmen about 48 to 54 mm.

Weight, ♂ 1½ to 2¼ lbs., ♀ 1 to 1¾ lbs.

Female. General colour above brown, the feathers with buff or rufous margins, the head and neck being more or less spotted dark on a paler ground; scapulars unmarked dark brown; rump and upper tail-coverts brownish-black; wings as in the male but the chestnut obsolete or much less in extent; below the breast, sides and under tail-coverts are pale rufous, sometimes darker, spotted with brown; abdomen white.

Colours of soft parts. Bill dull orange to yellowish-brown, the tip darker.

Young in first plumage like the female but with no chestnut or black on the wing; the feathers of the underparts have dark brown centres.

Nestling. Like that of the Mallard but more golden-rufous on the chin and throat and having a small black spot at the corner of the gape.

Distribution. Circumpolar in the Northern Regions, breeding in the Subarctic area and extending in Winter to North and Central Africa, the whole of Southern Asia and as far South as Jamaica and Mexico in America.

Nidification. Although a few birds have been shot in Kashmir, Cachar, Thall and Lachi in late May and June, it is improbable that the Gadwall breeds anywhere within our limits. In Europe it breeds as far South as Spain and South Russia but how far South in Asia is not yet known. A drake Gadwall and some eggs were sent me from Tibet taken on the 20th of June but it is possible that the eggs and their owner got mixed up.

The nest is very like that of the Mallard and is nearly always placed on the ground in dense vegetation close to the edge of a swamp or lake. The eggs number six to ten, occasionally twelve or fourteen, and in colour are a clear pale yellow or greenish stone-colour, becoming dull grey-green or drab-green as incubation advances. The average of one hundred eggs (*Jourdain*) is 55·3×39·7 mm.: maxima **58·0**×41·0 and 57·5×**43·5** mm.; minima **51·0**×**34·5** mm.

The breeding-season is from the end of April to the first few days of June.

Habits. In India the Gadwall is perhaps the most numerous of our non-diving ducks, occurring in immense flocks from Sind to Assam and Manipur, where it arrives about the middle of October, working South in ever lessening numbers, one specimen having been shot in Ceylon. It is one of the finest game-ducks whether considered from the point of view of epicure or sportsman. It feeds on wild rice, water-plants and berries of many kinds and also on worms, larvæ and small mollusca.

Genus **MARECA**.

Mareca Stephens, Gen. Zool. (Shaw), xii, pt. 2, p. 130 (1824).

Type by orig. desig., *Anas penelope* Linn.

In *Mareca* the bill is small, shorter than the head, depressed and slightly tapering towards the tip; the nail is proportionately large; the tail is short, cuneate and has fourteen feathers; the tarsus is rather short, scutellate in front; the hind toe is small with a narrow lobe.

Of the three species in this genus, two are confined to America, whilst the third is found over the greater part of Europe, Africa and Asia.

(2270) Mareca penelope.

The Wigeon.

Anas penelope Linn., Syst. Nat., 10th ed., i, p. 126 (1758) (Sweden).
Mareca penelope. Blanf. & Oates, iv, p. 445.

Vernacular names. *Peasan*, *Patari*, *Pharia*, *Choto Lalsir* (Hind.); *Cheyun* (Nepal); *Pharao* (Sind); *Khaltryia Kunda* (Assam).

Description.—Male. Forehead, crown and nape pale buff, sometimes with a few black dots on the nape; remainder of head and neck dull chestnut, much speckled anteriorly with black and the chin and throat more or less black also; back, sides of neck and upper breast, flanks, scapulars, rump and shorter upper tail-coverts vermiculated blackish-brown and white, the rump and tail-coverts with the white predominating; longer upper tail-coverts black; central rectrices brownish-black, getting paler on each succeeding pair, the outer pairs being also tipped white; smallest wing-coverts greyish-brown, vermiculated with white; primary coverts vinous-grey; remaining coverts white; the greater secondary coverts tipped black: primaries brown, pale-shafted except at the tips; outermost secondaries brilliant metallic green, broadly edged and tipped black; outer web of next secondary pure white, edged black; inner secondaries black, edged white and greyish on the inner webs; upper breast and lower neck, as well as the sides of lower breast, vinous-red; under tail-coverts black, rest of under plumage white.

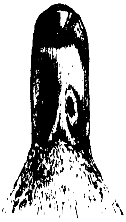

Fig. 82.—Head of *M. penelope.* ½.

Colours of soft parts. Iris brown or red-brown; bill grey-blue, livid blue or slate-blue, the tip black; legs plumbeous tinged with grey or green, the joints and webs darker and the claws blackish.

Measurements. Wing, ♂ 254 to 273 mm., ♀ 233 to 256 mm.; tail about 95 to 110 mm.; tarsus about 35 to 40 mm.; culmen about 31 to 35 mm.

Weight, ♂ 1 lb. 5 oz. to 1 lb. 10 oz., ♀ 1 lb. 3 oz. to 1 lb. 10 oz.

Female. Head and neck pale reddish-brown, richer posteriorly and paler below, speckled with very dark brown; rest of plumage above brown with pale edges to each feather, varying from almost white to rufous; the scapulars and interscapulars barred with the same; smaller wing-coverts like the back; median the same but with broader pale edges; greater coverts with still broader paler edges; quills plain brown; a dull blackish-brown speculum edged by the more or less white tips of the secondaries and the broad white edge of the one adjoining it; innermost secondaries edged with fulvous; lower neck and breast reddish-brown, sometimes speckled darker; lower breast, abdomen and vent vary from white to uniform pale bright rufous-buff; the flanks and axillaries darker buff and often more or less spotted with brown, under tail-coverts the same as the abdomen but each feather centred with brown.

Colours of soft parts. Iris pale to dark brown; bill slaty-blue, the tip and nail black and the base often darker; legs grey or drab marked with dusky.

Male in eclipse plumage. Resembles the female but is always distinguishable by the white wing-coverts; the sides of the body and flanks are richer cinnamon-brown.

Nestling in down. Above blackish-brown, the down filaments cinnamon; wing-bar and patches on each side of the back and rump cinnamon-buff, sometimes obsolete; chin and throat creamy-buff, fore-neck darker buff; rest of underparts creamy-buff.

Distribution. Breeding in the Palæarctic region and wintering in Africa, India, China etc. In India it occurs everywhere except in the extreme South and in Ceylon. It is common in every part of Assam and has been recorded from most parts of Burma.

Nidification. The Wigeon breeds throughout the whole of its Summer habitat South of the Arctic Circle. The nest may be placed close to water or hidden in heather and bracken some distance from it; it is said to be generally better built than the nests of most ducks. The materials, moss, leaves, grass and rushes, are well matted together, whilst the down not only forms a dense bed for the eggs but is much mixed into the body of the nest itself. The eggs number six to ten, sometimes twelve. In colour they vary from a very pale cream to a fairly warm cream or buff. The texture is fine, close and glossy. One hundred and seventeen eggs (*Jorudain*) average 54·7×38·7 mm.: maxima **59·5**×38·5 and 58·0×**41·0** mm.; minima **49·9**×**35·2** mm. The breeding-season is from the second half of May in the South to the middle of June in the North, whilst Sandman has taken eggs in Northern Finland as late as the 2nd of July.

Habits. The Wigeon comes into India in vast numbers to Sind and the North-West, arriving late in October and leaving again at the end of March. South and East it decreases in numbers, though in some years it is very numerous in Manipur, Assam and Eastern Bengal. It is a duck of shallow swamps and marshes rather than of deep lakes and open waters and loves feeding in a few inches of water or in water where the weeds come close to the top. These birds are expert divers but do not feed by diving and prefer whenever possible to stand on their heads like the Mallard. They eat all sorts of mollusca, crustacea, insects and their larvæ, whilst they also graze on young crops and plants and eat many water-berries etc. Their own flesh is excellent and they are among the best ducks for the table. On the wing Wigeons are very swift but their habit of feeding among the reeds and water-plants enables the sportsman to get nearer to them than he can to most ducks. They are quick off the water but rise straight up and are off without twisting like Teal. Their note, constantly uttered, is a low, soft whistle.

Genus **NETTION.**

Nettion Kaup, Skizz. Entwick. Nat. Syst., p. 95 (1829).

Type by mon., *Anas crecca* Linn.

Nettion differs from *Anas* in its small size, small, narrow and tapering bill and in having fourteen or sixteen tail-feathers instead of eighteen or twenty.

Key to Species.

A. Speculum; outermost secondaries black with white tips, those next them brilliant metallic green, next to them again one black, others like the back	*N. crecca*, p. 431.
B. Speculum; secondaries bronze-green at base, then black and tipped white and their coverts tipped rufous	*N. formosum*, p. 433.
C. Speculum; outer secondaries black, except two or three in the centre which are bronze-green	*N. albigulare*, p. 435.

(2271) Nettion crecca crecca.

The Common Teal.

Anas crecca Linn., Syst. Nat., 10th ed., i, p. 125 (1758) (Sweden).
Nettium crecca. Blanf. & Oates, iv, p. 443.

Vernacular names. *Choto Murghubi*, *Kerra*, *Lohiya Kerra*, *Patari*, *Souchuruka* (Hind.); *Naroib*, *Tulsiabigri* (Beng.); *Baijilagairi* (Nepal); *Kardo* (Sind); *Kilowai* (Tam.); *Sorlai-haki* (Can.); *Kali-mari*, *Chila-hans*, *Patari-hans* (Assam); *Daophlantu-kashiba* Cachari).

Description. A broad band, surrounding the eye and running back to the nape glossy green, sometimes blackish on the neck; a narrow white line from the bill running back towards the eye and then dividing to surround the green; rest of head rich dark chestnut; chin and edge of lores black, lower hind-neck, back and inner scapulars vermiculated dark brown and white; remainder of back brown; rump brown, the feathers edged paler; upper tail-coverts richer brown, edged buff; tail brown, the feathers edged paler; outer scapulars buff with velvet-black edges; coverts brownish-grey, the greater broadly edged with white or pale buff; primaries brown; outer secondaries black, narrowly edged with white, next secondaries metallic green, the one next these black with a narrow white edge and the innermost all silvery-brown; sides of breast and flanks vermiculated dark brown and white, the vermiculations becoming bold black and white bars on the breast, in the centre reduced to black spots; abdomen white or pale buff; vent like the flanks; under tail-coverts buff laterally, black in the centre.

Colours of soft parts. Iris brown; bill black, paler and browner under the lower mandible; legs and feet olive-grey but varying from light bluish or olive-grey to deep slaty-blue or dark olive-plumbeous.

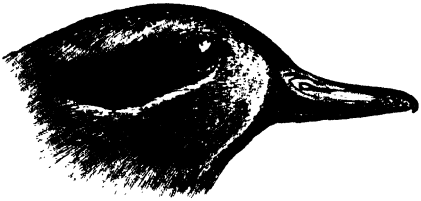

Fig. 83.—Head of *N. c. crecca.* ½.

Measurements. Wing 180 to 195 mm.; tail about 70 to 97 mm.; tarsus about 28 to 32 mm; culmen 35 to 41 mm.

Weight 7½ to 14 oz.

Female. Upper parts dark brown, the feathers edged with pale rufous; lores, throat and neck rufescent-white with brown specks, largest and most distinct on the neck; scapulars like the back, which with the wings is like that of the male; flanks and breast white, buffy-white, rufous or buff, the breast and flanks spotted with dark brown, sometimes obsolete, sometimes showing as bold drops.

Colours of soft parts. Bill more yellow-brown than in the male, sometimes tinged with green.

Measurements. Wing 170 to 186 mm.

Male in eclipse plumage. Mantle and scapulars broadly edged and marked with rufous-buff; crown and nape blackish-brown, the feathers narrowly edged with buffish-cinnamon; rest of the head as in the female; underside as in females but the flanks marked with brown bars and spots.

Nestling. Similar to that of the Mallard but much smaller with the upper parts more cinnamon and less yellowish.

Distribution. Breeding throughout the Palæarctic region and wintering in Africa, as far South as Abyssinia on the East and Wadan on the West; all Southern Asia including India, Burma, South China and Japan. In India it has occurred practically everywhere, including Malabar, Ceylon, Andamans and Nicobars. In Burma it has not yet been recorded South of Pegu.

Nidification. The Teal never breeds within Indian limits, though odd birds are found in India throughout the Summer months. They commence breeding in the South in early May or even April but in the North not until the end of May or early June. The nest is generally placed at the edge of swamps and lakes and even when, as is sometimes the case, it is built in among the heather on moors, a wet and boggy place is nearly always selected. It is made of reeds, rushes, grass etc., fairly well made and always very thickly lined with down, the latter being blackish-brown with pale centres. The eggs number seven to ten, sometimes more, twenty having been recorded. They are a very pale buff or cream in colour, highly glossed and smooth and usually rather long ovals in shape. Two hundred eggs average 44·5 × 32·7 mm.: maxima **49·5** × 34·0 and 46·8 × **35·6** mm.; minima **41·0** × 32·9 and 44·6 × **31·0** mm. The duck is said to sit very close and to flutter round about anyone who tries to rifle her nest

Habits. The Common Teal are among the earliest ducks to arrive in India and I have repeatedly seen them at the end of August in Assam. They arrive in flocks of some size, generally twenty to forty and sometimes ten times that number. In Sind and the Punjab and again in the Chilka Lake in Orissa they are said sometimes to occur in thousands and even so far South as Ceylon they collect in very large flocks. They are most attractive game-birds, for unlike so many ducks they feed in among reeds, water-weeds etc. round the open water and quite good bags may be obtained without driving by a single gun in a dugout or small boat. They feed principally at night, or in the early mornings and late evenings but, even when resting, may still be found in the reed-beds. They are fine fliers and though so small, their compact plumage withstands a lot of shot, so that straight shooting is required to bring them down. They feed on plants, young crops and almost all small crustacea, molluscs, worms, grubs, snails etc. and are themselves a great dainty on the table.

(2272) Nettion formosum.

THE BAIKAL TEAL.

Anas formosa Georgi, Bemerk. Reise Russ. Reich., p. 168 (1775) (Sweden).
Nettium formosum. Blanf. & Oates, iv, p. 442

Vernacular names. None recorded.

Description.—Male. Forehead, crown, chin, throat, upper fore-neck and a broad line surrounding the eye running to the fore-neck black, narrowly edged with pure white; a patch from behind the eye meeting on the nape and expanding on the sides of the neck metallic green; on the neck the green is followed on the sides by a black patch, whilst there is another black patch on the hind-neck, both surrounded with white except on the lower side of the hind-neck; face buff; space behind the ocular black line buff, meeting on the fore-neck below the black; a narrow indistinct white line below this on the neck; upper back, shorter outer scapulars, sides of breast and flanks very finely vermiculated slate-grey and white, the first colour dominant; a line down centre of back, inter-scapulars and lower back brown, each feather edged paler; lower back and rump greyer and more uniform; tail-coverts brown, the inner webs edged with white; tail brown, finely edged with paler brown; longer scapulars black, the inner webs white and outer webs edged bright rufous; wing-coverts brown, the greater secondary coverts tipped with rufous; primaries light brown, darker on the tips and outer webs; outer webs of secondaries next the coverts bronze-green, forming the speculum, followed by bold black sub-tips and white tips; inner secondaries brown, those between the speculum and the third innermost marked with black and edged with rufous on the outer webs; upper breast, next the white ring, vinous-buff changing to buff on the lower breast and finally to white, pale buff or rusty on the lower plumage to the vent; a white bar under the shoulder of the wing; axillaries white, mottled with light brown at the bases; under tail-coverts black, tipped with mottly white and pale rufous; a white band on the extreme posterior flanks next the coverts.

Colours of soft parts. Iris brown, red-brown or chestnut-brown; bill dark bluish or slaty-black to black; legs and feet pale plumbeous or slaty-blue.

Measurements. Wing 203 to 219 mm.; tail 86 to 95 mm.; tarsus about 31 to 35 mm.; culmen 33 to 38 mm.

Female. Upper parts dark brown, almost black on the crown; the feathers edged pale fulvous, making the head and neck look streaked and the back and scapulars squamated; lower back and rump greyer and the pale edges obsolete; wings as in the male but the speculum restricted in size and with less green; a narrow supercilium, sides of head and posterior lores white streaked with dark brown; anterior lores, a patch in front of the eye and a narrow streak behind dark brown; a buff or white spot below the brown lores; chin and throat white or buffy-white; lower plumage white, buffy-white or pale rusty; the lower fore-neck streaked with dark brown; breast darker rufous-buff than elsewhere, with broad blackish-brown centres, these continue down the flanks, becoming smaller and paler ceasing altogether in the centre of the abdomen; vent and under tail-coverts more broadly centred with brown; axillaries and median under wing-coverts pure white, the extreme bases barred with blackish.

Young males closely resemble the females but are more heavily spotted on the breast and barred on the flanks.

Distribution. Siberia, from Lake Baikal, East to Mongolia, Manchuria, Japan and Northern China. In Winter South to India, Burma and China. In India this is one of our rarest visitors. Blyth obtained one specimen in the Calcutta Bazaar; in 1879 Chill obtained a male near Delhi. Since then the following have been recorded:—1898, Gujerat (*Barton*); 1907, two, Behar (*De Vitre*); 1908, 1909, Lyallpur, (*Aitken*); 1912, Assam (one *Eden* and one *Harrison*); 1913, Goruckpore (*Hope Simpson*), Dibrugarh (*Colonel Row*), Manipur (*Higgins*); 1916, Manipur (*Higgins*).

Nidification. Middendorf found this beautiful Teal breeding on the Boganida in June and July; Dybowski obtained eggs in Darasan in June, whilst I have one egg of a clutch taken on the Amur on the 29th of April. The nest is said to be like that of the Common Teal and generally placed in meadow-like land on the banks of rivers or lakes and well hidden. Twenty eggs average 48·0 x 34·3 mm.: maxima **58·5** x **36·0** mm.; minima **45·0** x **32·5** mm.

In colour they are a pale buff, very like the eggs of the Common Teal.

Habits. Like those of other species of the genus, frequenting lakes, ponds and marshes, less often rivers and open water. The voice is very distinctive, a loud clucking which has been likened to the syllable "mok," rapidly repeated. Pzjevalsky remarks that when on migration this Teal flies very low over the plains which surround the lakes they resort to.

(2273) Nettion albogulare.

THE ANDAMAN TEAL.

Mareca albogularis Hume, Str. Feath., i, p. 303 (1873) (Andamans).
Nettium albigulare. Blanf. & Oates, iv, p. 444.

Vernacular names. None recorded.

Description.—Male. Crown and forehead dark brown, paler on the upper cheeks and streaked with dark brown; a ring of white feathers round the eye and sometimes a few white feathers on the lores; whole upper plumage dark brown, the feathers of the back and the scapulars with pale edges; outer secondaries velvety-black, except the 7th, 8th and 9th, which are glossy greenish-bronze; a narrow border of white to the speculum and the tips of the greater coverts broadly white next the speculum; chin, throat and lower cheeks white; the remainder of the lower parts brown, rather duller than the back, each feather edged paler brown.

Colours of soft parts. Iris reddish-brown or red; bill greenish-blue, plumbeous-blue or plumbeous with the nail black: in some specimens the lower mandible is tinged with pink over the whole or the greater part of its length; legs and feet dark greenish or plumbeous, the nails black.

Measurements. Wing 190 to 206 mm.; tail 100 to 110 mm.; tarsus about 130 to 140 mm.; culmen about 32 to 35 mm.

Weight about 1 lb.

The female only differs from the male in having the brown a trifle duller and the dark centres to the feathers less distinct; the speculum is more coppery in tint.

Measurements. Wing 175 to 185 mm. Weight about 12 oz.

Young birds are like the female but have the dusky markings below less distinct and the white eye-ring narrower and tinged with fulvous.

Distribution. Andamans and Cocos Islands. One specimen was shot by Mr. C. W. Allen at Bassein, Burma. Commander N. F. Wilson obtained it both on the Great Cocos and again on Landfall Island.

Nidification. Wimberly recorded a nest of this bird containing one egg taken in a paddy-field near Port Mouatt. This nest was said to have been composed of grass and to have been placed on the ground. The egg measured 1·93 × 1·43 inches (= 49·0 × 33·2 mm.) This may have been the nest and egg of a Whistling Teal.

Osmaston found the Andaman Teal breeding in August, laying their eggs in large natural hollows of lofty dead trees, often very difficult or impossible to get at. One clutch of ten fresh eggs was taken on the 4th of August from a hollow near the top of a Padouk-tree about sixty feet from the ground. There was no nest, the eggs lying on the chips of dead wood. The eggs are a very pale cream, rather long ellipses in shape and very smooth with a slight gloss. They average 49·6 × 36·3 mm.: maxima **51·2** × 36·3 and 48·1 × **37·3** mm.; minima **47·3** × 35·8 and 49·0 × **35·7** mm.

Habits. The Andaman Teal is common in most of the islands of the Andamans, resorting principally to outlying freshwater jheels and swamps but also frequenting tidal creeks and salt water. They collect in flocks of some size which break up into smaller parties of six to a dozen about June, when the breeding-season is near and in July go off in pairs. They feed much by night, at which time they will enter gardens which have ponds or tanks though for the most part they keep to the paddy-fields. They live on young crops, grain etc. but probably also eat grubs, insects and worms. They fly well, much like Common Teal, swim at a great pace but never seem to dive; even when wounded, birds seek safety by creeping into the jungle instead of diving. Their note is a low, soft whistle but Butler says they also have a low quacking note, uttered by both sexes and, possibly, employed as a call-note, as he heard it used when a flock he was watching saw another flock approaching overhead.

Genus DAFILA.

Dafila Stephens, Gen. Zool. (Shaw), xii, p. 126 (1824).

Type by mon., *Anas acuta* Linn.

This genus may be easily recognized by its elongate form, long neck and the lengthened and pointed tail-feathers, of which there are sixteen or, rarely, eighteen; the bill is rather narrower proportionately than in the genus *Anas* and differs in having the end rather broader than the base; the wings are long and pointed, the tarsus normal, the hind toe moderate with a narrow lobe.

The sexes differ in colour.

The genus is represented in India by one Winter visitor from the Northern Hemisphere.

(2274) Dafila acuta acuta.

The Pintail.

Anas acuta Linn., Syst. Nat., 10th ed., i, p. 126 (1758) (Sweden).
Dafila acuta. Blanf. & Oates, iv, p. 447.

Vernacular names. *Sand*, *Sink-par* (Hind., N.W.P.); *Kokarali Drighush* (Sind); *Dig-hans*, *Sho-lon-cho* (Beng.); *Digunch* (Nepal); *Nanda*, *Nanja* (Ooriya); *Laitunga* (Manipur); *Nejal-hans*, *Dighalnegi* (Assam); *Daophlantu-loubi* (Cachari).

Description.—Male. Whole head brown, varying from a rather pale dingy to a rich dark umber, glossy on the upper parts, with a purple or copper sheen, more especially on the sides of the sinciput and nape; chin and throat sometimes rather paler than the upper parts; nape almost black, grading on the one hand in the rich brown of the head and, on the other, into the grey of the hindneck; the grey here is formed by the most minute stipplings of brown and pale grey, gradually changing into more pronounced stipplings and bars on the upper plumage; a white band on each side of the nape forming the white of the neck; rump like the back; upper tail-coverts black edged with grey; longer scapulars velvety-black edged with silver-grey; shorter scapulars like the back, but often with dark centres; wing-coverts brownish-grey, the greater tipped with rufous-chestnut; secondaries forming the

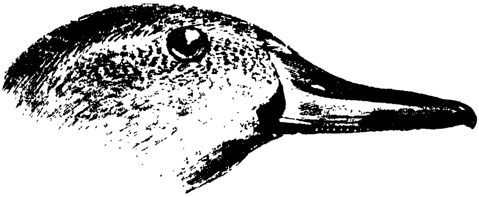

Fig. 84.—Head of *D. a. acuta*. ½.

speculum bronze-green, tipped white, subtipped black; the feather next the speculum black with a narrow white tip, a line of white next the quill and the inner web brownish-grey; remaining inner secondaries grey on the outer webs, black edged with grey on the inner; central rectrices black, the lateral ones grey-brown; neck and breast white; abdomen white, more or less stippled with grey about the vent; flanks and sides like the back; under tail-coverts black except the exterior lateral feathers, which are white; the flanks next the tail-coverts are white, more or less tinged with buff and with the vermiculations fainter than on the rest of the flanks.

Colours of soft parts. Iris dark brown, often tinged with red; bill light to dark plumbeous, the culmen, lower mandible and base darker; legs and feet dark plumbeous-grey or blackish; webs, claws and joints still blacker.

Measurements. Wing 264 to 292 mm.; tail up to 228 mm. long, generally about 150 to 180 mm; tarsus about 37 to 40 mm.; culmen 54 to 58 mm.

Weight 1¾ to 2¾ lbs.

Female. Head brownish-buff with dark centres to the feathers: throat and chin paler; neck brownish-buff speckled with brown; upper parts brown, the feathers edged with white or buffy-white and the scapulars with a few white bars in addition; the white tips of the secondaries and greater coverts form two wing-bars, but there is no speculum; quills dark brown, the inner ones narrowly edged white and paler on the inner webs; lower parts dingy-white tinged with buff or rufous and streaked with dark brown.

Colours of soft parts the same as but duller than in the male.

Measurements. Wing 235 to 260 mm.

Young males have the wing coloration of the adult male but are otherwise like the female.

Male in eclipse plumage closely resembles the female. In some individuals the mantle is dark ashy-grey or blackish-grey coarsely vermiculated with greyish-white.

Nestling in down. Like that of the Mallard but the line through the eye darker, whilst there is a second dark line from the lores below the eye to the nape; the lower plumage is suffused with grey instead of buff.

Distribution. The Northern Old-World Hemisphere, breeding as far South as Spain and Southern France, whilst in Winter it is found in Northern Africa and practically the whole of Southern Asia, also occurring in Panama, Cuba, Hawaian Islands etc.

Nidification. The Pintail breeds in the South in April and May and in the North in May and June and, often, in the early part of July. The favourite site is open grass-land, marshy under foot but not deep swamp, though it may be immediately surrounded by such. Nor does it make its nest in among the dense reeds as do some of the Pochards but selects green grass, long enough to conceal the nest and no longer. Occasionally it is said to make its nest among bushes like the Mallard but this is exceptional. The duck sits until almost trodden on and then flutters along the ground for some distance as if ill or wounded. The nest is well made, dry and compact with the usual mass of down as a lining, built up in a wall all round the nest like that of the Mallard, Teal etc. The eggs number seven to twelve, eight to ten being the usual clutch. In colour they are most often a very pale delicate sea-green, occasionally with a buffish tinge. One hundred measured by Gobel average 55·0 x 38·8 mm., another hundred measured by myself average only 53·2 x 37·1 mm., almost identically the same as forty British eggs measured by Jourdain. Maxima **57·0** x 38·1 and 53·5 x **39·1** mm.; minima **49·9** x 36·1 and 54·4 x **38·6** mm.

Habits. The Pintail is one of the most common of the ducks visiting India and may be seen in flocks numbering from twenty to two hundred, or even bigger. In North-West India large numbers arrive in October but in the East few arrive until November, whilst in Kashmir Magrath shot them as early as the 27th of September. In the non-breeding season these duck seem to prefer large open expanses of water, fringed with weeds and rushes and the open part amply provided with lotus and other surface plants, among which they can lie hidden and sleep in the heat of the day. Their food consists mainly of small crustacea and mollusca and to a less extent of shoots of plants and water-weeds. For the table they are among the best of all the duck and, as they are shy birds and fine fliers, they are among the best of game-ducks also. Their call is a soft quack or chuckle, whilst in the breeding-season the drake is said to utter a "deep click" as he swims round the female.

Genus QUERQUEDULA.

Querquedula Stephens, Gen. Zool. (Shaw), xii, (2) p. 142 (1824).

Type by taut., *Anas querquedula* Linn.

In *Querquedula* the bill is broader than in *Nettion* and instead of the two sides being parallel throughout their length, the width is greater at the tip than at the base; the nail also is broader and larger; the labyrinth, or long enlargement of the lower part of the trachea of the drake, is different in shape from that of *Anas*, *Nettion* and others enlarging downwards and bilaterally instead of on one side only; all the members of this genus have blue or blue-grey wing-coverts.

(2275) Querquedula querquedula.

THE GARGANEY OR BLUE-WINGED TEAL.

Anas querquedula Linn., Syst. Nat., 10th ed., i, p. 126 (1758) (Sweden).
Querquedula circia. Blanf. & Oates, iv, p. 449.

Vernacular names. *Chaitwa*, *Khira*, *Patari* (Hind.); *Gang-roib*, *Giria* (Beng.); *Ghila-hans* (Assam).

Description.—**Male.** Crown and nape deep brown, lighter on the forehead, where it is more or less streaked with white and sometimes faintly glossed at the sides; a broad white superciliary stripe from in front of the eye down the sides of the nape; chin black; remainder of head and neck bright rich chocolate, streaked with white; back, rump, upper tail-coverts and tail brown, the feathers all edged paler or greyish-brown; inner scapulars black, glossed with green and with broad white central streaks and narrow white edges; outer scapulars the same but with the outer webs broadly blue-grey; wing-coverts bright pale French grey, the greater broadly edged with white, forming a wing-bar; outer secondaries brown-grey, glossed with green and tipped with white; other quills brown, the inner primaries greyish, broadly edged with greyish-white; breast brown with black or dark brown markings, concentric on the upper breast, in the form of bars on the lower breast, gradually changing from the one to the other; abdomen white, more or less speckled with brown towards the vent, thigh-coverts brown and white; flanks white, finely barred with black, the feathers nearest the tail with two broad bars of white and grey divided by a narrower black line; under tail-coverts white or buffy-white, the shorter with brown drops; under wing-coverts mainly dark grey, the central coverts and axillaries white.

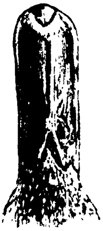

Fig 85.—Bill of *Q. querquedula.* ½.

Colours of soft parts. Iris dark brown; bill brownish-black, the nail quite black, margins of the commissure and gape paler and often reddish; legs and feet dark grey. The female has the same colours.

Measurements. Wing, ♂ 192 to 209 mm., ♀ 177 to 192 mm.; tail 68 to 74 mm.; tarsus about 25 to 29 mm.; culmen 44 to 49 mm.

Female. Above dark brown, all the feathers with pale margins, except the crown, which is rather richer than elsewhere and is marked with dark streaks; chin and throat white; neck greyish or buffy-white, minutely streaked with dark brown; a supercilium from above the eye and a spot on the lores white or buffy-white; wing greyish-brown, in old females more grey, especially on the smaller coverts; speculum as in the male but very dull and indistinct; fore-neck and upper breast brown, with broad pale edges to the feathers; lower breast, abdomen and vent white, buffy-white or buff; the flanks and under tail-coverts the same, blotched, barred and spotted with brown.

Young males are like the female but are darker, with more brown on the underparts, the speculum better defined and the lower wing-coverts more grey.

Male in eclipse plumage resembles the female except that it retains the fully-coloured wing.

Nestling like that of the Teal but with the underparts more yellowish; there is a well-defined broad buff line over the eye, whilst the dark streak through the eye is broader and darker; there is a yellowish spot on the lores.

Distribution. The Palæarctic Region, migrating South in Winter as far as Somaliland in Northern Africa, the whole of Southern Asia and Japan, the Philippines, Borneo, Java etc. In India it occurs commonly everywhere from Kashmir to Ceylon and in Burma almost in equal numbers to the extreme South of Tenasserim.

Nidification. The Garganey breeds in May and early June, making its nest in wet meadows and grass-lands or sometimes on marshy spots in small islands. The nest sometimes consists of a mere depression in the grass but if in wet places the depression is well lined with very fine grass- and rush-blades in addition to the great quantity of down always present. Wherever placed the nest is always well hidden, though, as the Teal never rises until the last moment, she always gives it away. The eggs number six to a dozen, generally seven or eight. In shape they are rather narrow ellipses and in colour buffy-white to warm cream with a distinct gloss, One hundred and eight average 45·5 x 32·8 mm.: maxima **49·0** x 32·9 and 43·8 x **35·5** mm.: minima **39·3** x **29·7** mm.

Habits. In the North-West of India the Garganey is one of the earliest duck arrivals, generally appearing in mid-September in some numbers, whilst Hume records a flock which he estimated at 20,000 in the Etawah district as early as the 28th of August. This Teal may be found anywhere where there is sufficient water, in the widest swamps as well as in small tanks and village ponds, keeping to open water in closely-packed flocks by day and feeding by night. They are mainly vegetarian feeders and delight in young crops of rice, wheat etc., often doing a great deal of damage. Their flight is very fast and the swishing hiss of their wings overhead cannot be mistaken for the flight of any other duck. They are excellent for the table.

Genus SPATULA.

Spatula Boie, Isis, 1822, col. 564.

Type by mon., *Anas clypeata* Linn.

The present genus is easily distinguishable from any other by its large spatulate bill; this is longer than the head, depressed, twice as broad at the tip as at the base, whilst the sides of the upper mandibles are much turned down near the tip; the lamellæ are very long and very closely set; there are only fourteen tail-feathers, which are rather acuminate; the wing is normal, long and pointed.

The genus has a very wide range over Australia, South Africa and South America, whilst the species which visits India is found over practically the whole of Europe and Asia.

(2276) Spatula clypeata.

THE SHOVELLER.

Anas clypeata Linn., Syst. Nat., 10th ed., i, p. 124 (1758) (South Sweden).

Spatula clypeata. Blanf. & Oates, iv, p. 452.

Vernacular names. *Tidari, Punana, Tokarwalla, Ghirah* (Hind.); *Panta-mukhi* (Beng.); *Dho-bahar, Sarkar* ♂, *Khikheria Sankar* ♀ (Nepal); *Alipat, Gino, Langho* (Sind); *Khantiya-hans, Nakdungara* (Assam).

Description.—Male. Whole head and neck glossy green, showing a purple tinge in certain lights, especially on the upper parts; lower neck, upper breast, outer scapulars and outer portions of back mauve-white; a narrow centre patch on the neck brown, the feathers edged paler, in some broadly white; back brown, the feathers pale-edged; rump and upper tail-coverts black, glossed with peacock-green and blue, the former tint predominating; rectrices brown, edged white, the white increasing in breadth on the outer feathers; wing-coverts a beautiful blue-grey, some of those next the inner secondaries glossed deep Prussian blue on the terminal quarter of the outer web; greater coverts more brown, forming a wing-bar next the speculum; one of the outer scapulars brilliant grey-blue; others black, glossed with green and with white centres; inner secondaries deep brown-black, glossed with green turning bluish at the tips; primaries dark brown; speculum a brilliant metallic green; lower breast, flanks and abdomen a rich rufous-chestnut, some of the feathers on the posterior and inferior flanks lighter and vermiculated with brown; sometimes a few black spots on the breast; thighs dull rufous-chestnut; under tail-coverts black glossed with blue-green; flanks next the tail-coverts white.

Colours of soft parts. Iris yellow, orange or orange-red; brown or orange-brown in the female; bill black, in breeding-season greyish-black or plumbeous-black; the female has the bill more brown, often tinged with orange; legs and feet orange, orange-brown or red.

Measurements. Wing, ♂ 230 to 262 mm., ♀ 217 (*Witherby*) to 238 mm.; tail 72 to 86 mm.; tarsus about 32 to 38 mm.; culmen, ♂ 61 to 71 mm., ♀ 56 to 64 mm.

Weight, ♂ 1 lb. 3 oz. to 1 lb. 14 oz., ♀ 1 to 1½ lbs.

Female. The whole upper plumage brown, each feather edged with pale rufous or dingy rufous-white; wing-coverts grey; quills brown with faint indications of the speculum and the white terminal bar well defined; lower parts dull brownish-buff, varying a good deal in depth and tint; the dark bases of the feathers show through as dark crescentic bands on the breast, flanks and sides but hardly, if at all, on the abdomen; chin unspotted; neck and sides of head speckled with dark brown; most ducks have a well-defined white loreal spot speckled with brown.

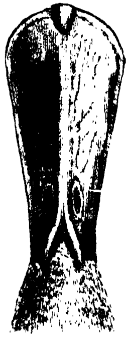

Fig. 86.—Bill of *S. clypeata*. ½.

Young males resemble the female but have the speculum more defined and the grey coverts brighter and clearer in colour: the legs and feet are generally flesh-coloured and the bill brown.

Male in eclipse plumage. Like the female but with the adult male wing coloration; the rump and upper tail-coverts remain as in breeding-plumage; the white of the breast generally shows a certain amount of dark brown crescentic barring and the black under tail-coverts are mottled with chestnut and white.

Nestling in down. Upper parts dark brown, the filaments tipped with dull cinnamon; pale patches, ill defined or obsolete, on the sides of the body and rump; lower parts greyish or creamy-white, the chin and throat darker and more cinnamon; a dark streak through the eye.

Distribution. Throughout the Northern Hemisphere, breeding North to 68°. In Winter it occurs over most of Northern Africa and has once been recorded from Cape Town. In Asia it wanders

South into all the islands of Austro-Malaysia and the Philippines etc. and the Hawaian islands. In India and Ceylon it occurs everywhere where there is water and in Burma over the whole of the North and Centre but it has not been recorded from Tenasserim, though it must visit that district.

Nidification. The Shoveller does not breed within our limits, though Layard once found it doing so in Ceylon in March, when he saw a female with twelve young, capturing most of the latter. In Europe it breeds from the end of April to early June, making the duck's usual nest of grass and rushes in swampy meadows, thin flags round marshes or, less often, in scrub and bush cover near lakes. Occasionally the nest is placed in reed-beds and one nest was found quite exposed on a bare mud-flat in a marsh. The eggs number from seven or eight to sixteen and are in colour pale stone or buff, rarely with a greenish tinge. One hundred eggs average 52·2×37·0 mm.: maxima **56·5**×38·0 and 54·0×**39·0** mm.; minima **48·0**×37·0 and 50·5×**34·5** mm.

Habits. The Shoveller is a rather late arrival in India, not appearing in any numbers until about the end of October. It leaves late also, many birds staying until well on in April. It is an entirely freshwater bird but is not particular as to its cleanliness and it may be found in insanitary village ponds and ditches as well as in the largest swamps and lakes. It requires shallow water to feed in and therefore keeps to the edges of the larger pieces of water where there is floating vegetation. Here it finds ample small crustacea, larvæ spawn, frogs, mud-fish etc. as well as a certain amount of vegetable food, "dibbling" on the surface or prodding in the mud. It occasionally feeds under water, tail in air, like the Mallard but far more often swims slowly about with the head only immersed, straining through its long thin lamallæ the food for which it is hunting. It is, for a duck, not much of a swimmer and hardly ever dives. On the wing it is strong and speedy but when killed it is generally unfit to eat, coarse and malodorous, so that sportsmen leave it alone. Its voice is like that of the Mallard but lower and softer and it has a low, quick chuckling quack like that of the Gadwall.

Genus **MARMARONETTA**.

Marmaronetta Reichenbach, Nat. Syst. Vögel, ix (1852-3).

Type by mon., *Anas angustirostris* Ménétriés.

The genus *Marmaronetta* differs from all other ducks in its curiously-marked grey plumage without any speculum. Its hind toe with its narrow lobe retains it in the true *Anatinæ* and structurally it is very close to *Nettion*. As in that genus, the labyrinth of the trachea is lateral; the bill is about equal to the head in length, narrow and parallel-sided with the nostril near the base; the tail has fourteen feathers; the wing is unusually short and rounded; the head is furnished with a thick but rather short crest.

The sexes are alike in plumage.

The genus contains one species occurring in the Mediterranean countries to Mesopotamia, Persia and Mekran.

(2277) Marmaronetta angustirostris.

THE MARBLED TEAL.

Anas angustirostris Ménétriés, Cad. Reis. Caucas., p. 58 (1832) (Lenkoran, Transcaspia).
Marmaronetta angustirostris. Blanf. & Oates, iv, p. 454.

Vernacular names. *Chöi* (Sind).

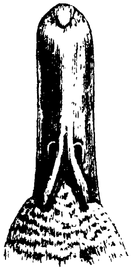

Fig. 87.—Bill of *M. angustirostris.* ½.

Description. Whole upper parts a silvery-grey, each feather having the central portion darker and brownish and the tip and terminal edge paler; the head and nape are more buff in tint, each feather centred brown; giving a barred appearance; the parts surrounding the eye brown, forming a distinct dark brown eye-patch; chin, throat and underpart of the neck paler, almost white, the dark centres reduced to an obsolete stippling; tail a silvery brown-grey edged paler; wings silver-grey, the outer secondaries a purer paler grey: inner webs of the primaries darker and browner; the wing-coverts and quills are all brown-shafted, the brown contrasting distinctly with the grey; lower parts white, more or less tinged with buff or grey; the breast and flanks distinctly barred with dark grey-brown; lower tail-coverts indistinctly barred with the same.

Colours of soft parts. Iris brown; bill bluish-grey, black or dusky on the culmen and tip, a line of leaden-blue next the forehead and along the edge of the upper mandible; a spot of the same colour above the nail; legs and feet dusky-olive or horny-brown, the claws and webs blackish; sometimes the legs are tinged greenish.

Measurements. Wing, ♂ 206 to 215 mm., ♀ 198 to 210 mm.; tail 76 to 105 mm.; tarsus 26 to 28 mm.; culmen about 40 to 45 mm.

Weight, ♂ 1 lb. 3 oz. to 1 lb. 5 oz., ♀ 1 lb. to 1 lb. 3 oz. (*Hume*).

Young birds are duller and greyer with the underparts almost uniform ; the creamy spots on the upper plumage are wanting,

Distribution. The countries North and South of the Mediterranean Sea; the Canaries ; East it occurs throughout South Russia, Asia Minor, Transcaspia, Palestine, Mesopotamia, South-West Persia, Mekran and Sind. In India it has occurred frequently in Gujerat, the North-West Provinces and the Punjab. Occasionally it wanders into the United Provinces and Central Provinces and it has been shot by Burton in Baroda, several times round about Calcutta and by Eden in Sibsagar, Assam.

Nidification. The Marbled Teal breeds throughout its normal range during May and June, during the former month in the Mediterranean countries and during the latter month in Baluchistan, Mekran, Sind and Persia. Their breeding in the various lakes in Sind and Mekran depends on the rainfall and it is possible that some years when this is exceptionally scanty they move to places where there is more water. Again, some of the places in which they do breed regularly are so far off the beaten track that they are but seldom visited. The nest is made of rushes and weeds and the downy lining is very scanty and sometimes wanting altogether. It is placed in weed-covered swampy land or in small islands in lakes and marshes and is usually well concealed. The eggs vary from nine to thirteen, though in Persia five and six eggs were found to be sometimes incubated. In appearance they are just like Teals' eggs but larger. Eighty-nine eggs average 46·5 × 34·2 mm.: maxima **50·6** × 33·4 and 47·7 × **36·0** mm.; minima **42·4**×32·9 and 46·6 × **31·5** mm.

Habits. The Marbled Teal is a resident bird almost wherever found but in Winter it seems to wander far and individuals are found at great distances from their usual haunts. In Sind it is a very common bird throughout the year but their numbers are augmented in Winter by Northern birds and Ticehurst remarks that he noticed "odd birds on passage" in August. This Teal avoids open water, keeping to reed-beds and to stretches of water overgrown with weeds and plants where it can easily find concealment. In many ways it is said to be very Coot-like, generally first seeking safety among cover and only rising when a boat is pushed within long-shot distance of it. These birds collect in flocks of some numbers and feed on many kinds of shoots, rootlets, grain etc. as well as on insects, larvæ, worms, small shell-fish etc. They fly well, but are not so fast as Teal or the more powerful ducks. They swim and walk well and dive with ease, resorting to diving when wounded, often clinging on to water-weeds with only the tips of their bills out of water. They are said to have two distinct notes, one a hoarse quack or croak, the other a whistle.

Subfamily NYROCINÆ.

This subfamily is separated from all the preceding subfamilies by the structure of the hind toe, which is rather larger and stronger and *is broadly lobed*, whereas the species of the other subfamilies have only a narrow lobe or no lobe at all. Blanford did not divide the diving ducks of this group from the swimming ducks, retaining all of them in the *Anatinæ* but the two groups seem to be well defined not only structurally but also in habits.

The *Nyrocinæ* contain a large number of genera of ducks all of which are expert divers, many feeding on deep-water plants etc. but which have proportionately shorter, smaller wings than the non-diving ducks and, though they fly with great speed, have a quicker wing-motion. They swim at a great pace, the powerful legs and feet, set rather far back, being more adapted for swimming than walking.

Three genera are represented in India, the subfamily being cosmopolitan.

Key to Genera.

A. Primaries with their bases more or less white.
  a. Lamellæ long and prominent .... NETTA, p. 447
  b. Lamellæ short, set well apart and not very prominent .... NYROCA, p. 450.
B. Primaries without any white at their bases. GLAUCIONETTA, p. 460.

Genus NETTA.

Netta Kaup, Skizz. Entwick. Nat. Syst., p. 122 (1829).

Type by mon., *Anas rufina* Pallas.

In this genus the bill is long, slightly tapering and very little raised at the base, the culmen being nearly straight; the nostrils are placed rather less than one-third the length of the bill from the base; the lamellæ are broad, prominent and set rather far apart; the feathering of the forehead is cut straight across, almost at right angles to the commissure; the feet are large and powerful, the hind toe broadly lobed; the wing is comparatively short and pointed; the tail of sixteen feathers is also short and cuneate; the sexes differ in colour and the male has a very full bushy crest.

In the genus *Netta*, as in all other genera of this subfamily, the wings appear to be set rather farther back than in the surface-feeding ducks, their position and their small size giving an action which at once distinguishes any member of the group when in flight.

There is only one species which occurs over most of temperate Europe, North Africa and Asia.

(2278) Netta rufina.

The Red-crested Pochard.

Anas rufina Pallas, Reise Russ. Reich., ii, p. 713 (1833) (Caspian Sea).
Netta rufina. Blanf. & Oates, iv, p. 456.

Vernacular names. *Lal-chonch*, *Lal-Sir* (Hind.); *Hero-hans* ♂, *Chobra-hans* ♀ (Beng.); *Dumar* ♂, *Sanwa* ♀ (Nepal); *Batsha*, *Rutabo* (Sind); *Deo-hans* (Assam).

Description.—Male. Whole head reddish-bay, richest and darkest on the underparts and sides, paling from the forehead to the crest, where it is reddish-buff; neck blackish-brown; upper back dark brown, getting more and more pale towards the rump; the bases of the feathers next the scapulars showing in a white band; rump and upper tail-coverts blackish-brown, more or less glossed green; tail silvery grey-brown, coverts bordering the wing and running into the scapulars white; other coverts greyish-brown; secondaries white, sometimes tinged grey or creamy, with a subterminal band of brown 60 to 100 mm. wide; inner secondaries like the coverts; outermost primary brown on the outer web and on the inside and tip of the inner web, the remainder white; on each succeeding primary the white increases until the innermost is all white with a broad brown tip; breast blackish-brown, paler on the lower breast and abdomen; under tail-coverts dark brown; flanks, axillaries and under wing-coverts white.

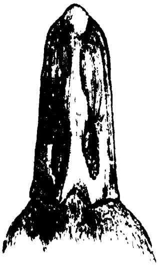

Fig. 88.—Bill of *N. rufina*. ½.

Colours of soft parts. Iris deep or light reddish-brown to bright light red; bill vermilion-red, the nail almost white tinged with pink or yellow; the base, next the forehead, and the gape are dusky on all but the oldest birds; legs and feet orange, orange-red or dull fleshy-red.

Measurements. Wing, ♂ 256 to 282 mm., ♀ 241 to 279 mm.; tail about 60 to 75 mm.; tarsus about 40 to 45 mm.; culmen, ♂ 48 to 54 mm., ♀ 44 to 51 mm.

Weight, ♂ 1¾ to 3 lbs., ♀ 1¾ to 2½ lbs.

Female. Above pale greyish-brown tinged with ochre; the crown rather darker and the scapulars rather paler; the feathers of the upper parts have pale margins, these being obsolete in very old birds; the wings are like those of the male but paler and duller, the white being replaced by grey or dusky white; whole lower plumage, axillaries and under wing-coverts greyish-white, yellowish-white, or greyish-ochre, darker on the flanks. The bill is dusky black, becoming red towards the tip; the nail still paler; the lower mandible dark at the base; legs and feet dull orange or orange-brown, the joints and webs blackish.

Young males are like the female but with dark brown centres to the feathers of the underparts; the back and breast are darker than in the female and there is more of a crest.

Males in eclipse plumage are like females but retain the bushy crest and the bright-coloured bill and feet and have more brown on the underparts.

Nestling in down. Upper parts brown or olive-brown with golden-olive tips to the filaments: a buff stripe over the eye and a dark streak running through it and dividing anteriorly; below greyish-white, the chin and throat more yellowish.

Distribution. Breeding in the Mediterranean countries in Europe and Northern Africa; South Russia, Turkestan, Persia, Afghanistan and Baluchistan, wintering in India and Burma.

In India it is common throughout the North, especially in the North-West; it is almost equally common throughout the Bombay Presidency, Central India and Orissa, but then becomes rare in Southern India and has only been doubtfully recorded from Ceylon. In Northern Burma it is not rare but does not extend far South. In Mysore, Travancore and the Southern Madras Presidency it is practically never seen.

Nidification. The Red-crested Pochard breeds from the middle of May to the middle of June, making its nest of reeds, rushes and grass inside reed-beds or in among thick cover in small islands in swamps and lakes. The nest is never in open swamps, meadows or grass-land. The down lining is very thick and is pale grey in colour with a dull white centre. The eggs number seven to twelve, generally eight or nine and are almost invariably a pale olive-grey, though exceptionally, they may be a buffy-white. Ninety eggs average 57·8×42·4 mm.: maxima **62·3×45·1** mm.; minima **53·0**×41·8 and 53·9×**39·6** mm.

Habits. This fine Pochard arrives in its thousands in India in the latter part of October, leaving again in March. Inglis records birds seen in Behar on July the 21st, in Bengal they are never seen until October the 1st, though in Assam they may arrive a week or so earlier. This is essentially a diving bird and though it may be sometimes seen "dibbling" for food, like Mallards and Shovellers, in shallow water, it subsists principally on roots and shoots of plants which grow in deep water and must be obtained by diving. These Pochards are almost omnivorous and their own flesh depends in quality on what they have been eating and may be either excellent or almost uneatable. They are active birds on water and have regular games, dashing hither and thither after one another in between dives of anything from thirty to ninety seconds each. They prefer water on which there is ample cover, though they may keep to the more open parts when resting in the heat of the day. Their ordinary note is a deep "kwoi," and they also have a sharp whistle, perhaps made by the male only.

Genus NYROCA.

Nyroca Fleming, Philos. Zool., ii, p. 260 (1822).

Type by orig. desig., *Anas rufa* Linn.

In *Nyroca* the lamellæ of the bill are short, set much further apart than in *Netta* and less prominent.

The bill is of moderate length, rather more raised at the base than in *Netta* and either equally broad throughout its length or slightly broader at the tip; the line of the culmen is concave and the feather-line at the base of the bill convex; the nostril is as in *Netta*; the characters of the feet, wings and tail as in that genus.

The genus is cosmopolitan and four species occur within our limits.

Key to Species.

A. Sides of bill parallel throughout their length.	
a. Back and scapulars distinctly barred or vermiculated	*N. ferina*, ♂, p. 450.
b. Back and scapulars merely speckled	*N. rufa*, ♂, p. 452.
c. Upper back and head rufous-brown; scapulars slightly vermiculated; no white speculum	*N. ferina*, ♀, p. 450.
d. No vermiculations on upper plumage; a white speculum	*N. rufa*, ♀, p. 452.
B. Bill wider at the tip than at the base.	
e. Head never crested; back and scapulars in adults not black	*N. marila*, p. 456.
f. Head always more or less crested; scapulars in adult black, more or less sprinkled with whitish............................	*N. fuligula*, p. 458.

(2279) Nyroca ferina ferina.

The Pochard or Dun-bird.

Anas ferina Linn., Syst. Nat., 10th ed., i, p. 126 (1758) (Sweden).
Nyroca ferina. Blanf. & Oates, iv, p. 458.

Vernacular names. *Burar-nar*, *Lal-sir* (Hind.); *Lal muriya* (Beng.); *Cheun* (Nepal); *Ranga-muriya* (Assam); *Thordingnam* (Manipur).

Description.—Male. Whole head and neck rich deep chestnut, changing rather abruptly into the black of the upper back and breast; rump and upper tail-coverts dull black; remainder of upper plumage extremely pale clear grey, very finely vermiculated with black bars; wing-coverts dark grey, more or less vermiculated with white; primaries dark grey, edged outwardly and tipped with black; secondaries forming a dull grey speculum, the feathers narrowly tipped with whitish, and divided from the inner secondaries by the narrow black borders of two or three of these feathers; lower breast blackish, the feathers more or less fringed with white; remainder of lower plumage white or very pale grey, sparsely stippled with black, the stipplings more numerous towards the vent and flanks; under tail-coverts dull black; tail dull greyish-brown, tipped paler. Occasionally there is a pure white spot on the apex of the chin.

Colours of soft parts. Iris yellow or reddish-yellow; base and tip of bill black, the intermediate portion varying from clear pale plumbeous-blue to rather dark slaty-blue; legs the same slaty-blue and varying in the same degree; webs and joints darker and blackish.

Measurements. Wing, ♂ 210 to 225 mm., ♀ 200 to 213 mm.; tail about 54 to 76 mm.; tarsus about 35 to 39 mm.; culmen 43 to 50 mm.

Weight, ♂ 1¾ to 2½ lbs., ♀ 1½ to 2¼ lbs.

Female. Forehead and crown dark brown, fading to dull fulvous-brown on the hind-neck and the sides of the head and neck; thence paling to pale fulvous-grey, or greyish-white, on the chin, throat and fore-neck; back and scapulars greyish-brown, with grey and black vermiculations, these varying much in extent and being sometimes completely wanting; lower back, rump and upper tail-coverts blackish, the external feathers of the rump marked with a few fine bars of white; tail and rump as in the male, but the latter much duller and less vermiculated; whole lower parts dull grey, tinged with rufous-brown on the breast and sides, the vent and under tail-coverts still more darkly tinged with brown.

Young males are like the female but have the head more reddish and paler, whilst the underparts are browner.

Males in eclipse plumage have the head paler and duller and the black of the back and breast replaced by brown.

Nestling in down. Dark brown above, the head and neck paler and more rusty; underparts dull yellowish-white; a bar across the wing and a spot on each side of the rump yellowish-olive; a brown streak from below the eye to the nape.

Distribution. Palæarctic region from Iceland to Japan. It winters throughout Southern Europe, Northern Africa and India. In the latter country it is very common throughout the North and gradually becomes less common towards the South, but has been recorded from Bellary and again from Bangalore (*King*) and Mysore (*Stewart*). It is common in Eastern Bengal, Manipur and Northern Burma but in the last-named country also does not go far South, though it has been recorded from Rangoon and Mandalay.

Nidification. The Pochard makes its nest almost invariably in among high reeds, rushes or similar cover and not in short grass and weeds in meadows. Often it is placed low down in reeds actually standing in water, supported partly by the growing reeds and partly by portions which are broken down and tangled. It is well made and, until the down is added, very like a Coot's nest to look at, a cup of flags, rush-blades and reeds. The eggs number eight to ten, sometimes six only, at other times up to fourteen. In colour the eggs are very dull greyish-drab or olive-drab but with no bright green tint ever present. One hundred and sixty eggs average 60·6 × 42·9 mm.: maxima **68·0** × 45·5 and 64·0 × **46·5** mm.; minima **54·1** × **37·2** mm. Pochards commence breeding in the South in the last week of April or early in May but in the North not until June, whilst Meiklejohn has taken fresh eggs as late as the 12th of July in Esthonia.

Habits. The Pochard arrives in India in the North in the middle of October, leaving again in the third week of March or early in April. In the South it arrives a fortnight later and leaves a week earlier. It may be found on almost any kind or size of water but prefers large open lakes and swamps which yet have plenty of reeds and cover round about, with deep parts in which the vegetation does not reach the surface of the water. These duck are fine swimmers and divers, getting most of their food by diving, whilst they also often chase and dive after one another in play. They feed on a most varied diet, often fish, frogs, mollusca and crustacea; at other times almost entirely on young crops, water-weeds etc. Upon the food they eat depends their value for the table and they may be either quite rank, fishy and unpalatable or tender and well-flavoured like their first cousins, the Canvas-backs of America. They fly well and, like all the true Pochards, *en masse* instead of in a V-shape or line. On land they are slow and awkward and, if hurried, tumble forward on to their breasts.

Nyroca rufa.

Key to Subspecies.

A. Back and scapulars slightly speckled with white.	
a. Head and neck dull chestnut or bay	*N. r. rufa*, ♂, p. 453.
b. Head and neck almost black	*N. r. baeri*, ♂, p. 454.
B. No white speckling on the back and scapulars.	
a. Head and neck rufous-brown	*N. r. rufa*, ♀, p. 453.
b. Head and neck mixed with blackish on the sides	*N. r. baeri*, ♀, p. 455.

(2280) Nyroca rufa rufa.

THE WHITE-EYED POCHARD.

Nyroca rufa Linn., Faun. Suec., 2nd ed., p. 47 (1761) (Sweden).
Nyroca ferruginea. Blanf. & Oates, iv, p. 460.

Vernacular names. *Kurchiya, Burar-mada* (Hind.); *Lal-bigri, Bhuti-hans* (Beng.); *Burnu, Burino* (Sind); *Malac* (Nepal Terai); *Kali-muri* (Assam).

Description.—Male. Whole head, neck and breast rich rufous or bay-brown, the nape somewhat darker; a dark collar of brownish-black round the neck, extending on the back of the neck to the back; a small white spot on the chin; whole upper parts dark blackish-brown or dull black, the feathers of the upper back and scapulars more or less vermiculated with rufous, the vermiculations sometimes obsolete; wing-coverts dark brown; the outer secondaries white with a broad subterminal black band; quills brown, the inner webs of the primaries greyish-brown; the innermost secondaries dark brown; breast rufous-chestnut, that colour merging into the black of the head, but sharply defined from the white of the abdomen and lower tail-coverts; feathers of vent brown at the base; flanks rufous-brown.

Colours of soft parts. Iris white, occasionally yellow and even more rarely pale brown; brown in the female; bill dull slaty or bluish-black; legs dull dark slaty, tinged with grey or green and sometimes mottled about the joints.

Measurements. Wing 175 to 192 mm.; tail 81 to 86 mm.; tarsus 29 to 32 mm.; culmen about 27 to 30 mm. The female is a little smaller; wing 170 to 182 mm.

Female. Similar to the male but with the whole plumage duller, the head and breast more brown than rufous and ill-defined from the white abdomen, which is more sullied, except in old females; the speckling on the back is never present. The iris is grey, brownish-grey or, in very old females, white.

Young males are similar to the female but have the whole head and neck suffused with ochraceous and the centre of the abdomen showing the brown bases to the feathers; the back also is lighter with the feathers more distinctly edged paler.

Nestling in down dark brown on the upper parts with pale spots on the wings and scapulars; underparts paler buff, shading into brown on the flanks.

Distribution. Western Palæarctic region as far East as the Valley of the Ob; the countries on the North-East of the Mediterranean and in Western Asia to Kashmir, Ladak and Tibet. In Winter it migrates as far South as the Canaries, Northern Africa to Abyssinia, India and Burma. In India it occurs South to Khed in Ratnagiri (*Vidal*), Malgenda, Mysore (*Allen*) and Madras. In Burma it has been obtained no farther South than Arakan.

Nidification. The White-eyed Pochard breeds in great numbers in all the lakes of Kashmir, during May and June. The nest is made of rushes and differs from the nests of most ducks in having a definite lining of finer strips of grass- and rush-blades between the body of the nest and the dense lining of down. It is generally placed close to the water in among reeds, supported either by the closely-growing stems or by a few of them broken down to form a platform. It is never built in meadow- or grass-land or in among short weeds on marshes like the nest of the Mallard. The eggs number six to ten or eleven and are a pale, rather dull buff in colour, varying very little either in tint or depth. One hundred and fifty average 51·7 × 37·9 mm.: maxima **62·8** × 36·0 and 37·0 × **43·0** mm.; minima **48·3** × 37·7 and 49·1 × **35·1** mm. European eggs average much larger than Indian. Jourdain gives the average of one hundred and ten as 52·3 × 38·2 mm., whilst sixty Indian eggs measured by myself average only 50·7 × 37·1 mm. I can, however, see no difference in the size of the birds.

Formerly a large trade was carried on in the eggs of these birds in Kashmir and they were taken in boatloads for sale as food. They are now very rigidly protected, yet are said to be decreasing greatly in numbers.

Habits. This, one of our most common Indian ducks, is certainly one of the most expert on or under the water, wounded birds often escaping capture by diving and holding onto weeds, sometimes until death actually occurs by drowning. On the wing it is fast and strong but on land quite out of its element, walking very badly. It, however, seldom ventures far from water, though it does not seem to mind whether the water is part of a huge lake or a weedy pond in a village. Like all diving ducks it certainly prefers wide stretches of semi-open deep water but I have shot it in rapid hill-streams, muddy stagnant rivers like the Barak or wide sandy ones like the Brahmapootra. Most people consider this Pochard the worst of all duck for the table but it varies greatly and whilst it is sometimes quite good it is often uneatable. Its note is a rather harsh "koor-ker-ker," which it utters both as it rises and when wandering about feeding.

(2281) Nyroca rufa baeri.

THE EASTERN WHITE-EYE.

Anas (*Fuligula*) *baeri* Radde, Reise Siberien, ii, p. 376, pl. 15 (1863) (Amur, Siberia).
Nyroca baeri. Blanf. & Oates, iv, p. 461.

Vernacular names. *Bor-kali-muri* (Assam).

Description.—Male. Similar to the Indian White-eye but with the whole head and neck black glossed with green, except for a large spot of white at the angle of the chin; the glossy green head and neck grade into rich rufous on the breast, the rufous richer than in the preceding bird; rest of plumage only differs in being brighter and *cleaner* looking.

Colours of soft parts. Iris white or golden-yellow, generally the latter; bill dull slate-blue, the basal third, tip and nail darker or black; legs and feet greyish-yellow to lead-grey, the joints and webs darker.

Measurements. Wing, ♂ 208 to 240 mm., ♀ 193 to 215 mm.; culmen 39 to 42 mm.; width at base 18·5 against 16·2 mm. in *N. r. rufa* and at broadest part nearly 23 mm. as against under 20 mm. in that bird.

The female and young differ from the male in having no black glossy head and are extremely difficult to distinguish from the Common White-eye. Their large size and proportionately larger bill should, however, draw attention.

Distribution. Amur to Kamschatka and Japan, migrating in Winter South to China and to Burma and Eastern India. In India this duck was first obtained by Duvacel in 1825 and again by Blyth in 1842 and 1845. No further specimens were recorded, however, until 1896, when Finn got eleven specimens in the Calcutta bazaar. From that time for several years it was obtained regularly in some numbers in Eastern Bengal. In Assam it occurs every Winter, though most young birds and females are doubtless overlooked from their very close likeness to the Common White-eye. I shot one or more specimens in Cachar, Lakhimpur and Tezpur, whilst both Higgins and Campbell shot others near Imphal in Manipur. Even in Burma, however, *N. r. rufa* is the common form, though Baer's Pochard is probably a regular but undetected visitor. For several years many sportsmen watched carefully for it and sent me many skins about which they were doubtful but only three of these from the Shan States and one from Bhamo proved to be *N. r. baeri*.

Nidification. Seebohm says that the Eastern White-eye breeds on the Amur, from which river I have received a single egg. It makes a nest like that of the Common White-eye in thick reed-beds but no full clutch of eggs seems to have been taken, so the number is unknown. In appearance they only differ from those of the preceding bird in being rather larger, six eggs averaging 52·1×38·3 mm.: maxima **55·0×39·0** mm.; minima **51·0**×38·0 and 52·4×**36·4** mm.

Habits. Very little recorded but those birds I have seen were certainly very strong fliers, outpacing the Western White-eye, with which they were associating. Finn also comments on the great flying powers of this duck but considers those he had in captivity to have been less expert divers than their Western cousins. The Assamese shikaries, who recognize this bird as being a distinct form, assert that it is a better flier, swimmer and diver than the common form and say that it is much more shy and difficult to get a shot at.

(2282) Nyroca marila marila.

The Scaup.

Anas marila Linn., Fauna Suecica, 2nd ed., p. 39 (1761) (Lapland).
Nyroca marila. Blanf. & Oates, iv, p. 462.

Vernacular names. None recorded.

Description.—Male. Head, neck, breast, upper back, rump and upper tail-coverts black, the first two glossed with green; lower back and scapulars white, finely barred with narrow zig-zag lines of black; tail blackish-brown; wing-coverts blackish-brown vermiculated and spotted with white; primaries black, the inner webs paler and browner except at the tips; outer secondaries white with blackish-brown tips; inner secondaries black or very dark brown glossed with green and, often, finely speckled with white; under wing-coverts and axillaries white, the coverts on the edge of the wing grey, speckled with white; abdomen and flanks white, the posterior abdomen more or less mixed with brown; vent and under tail-coverts very dark brown or black.

Colours of soft parts. Iris yellow or golden-yellow; bill greyish-blue, plumbeous-blue to slate-grey, the nail black; legs and feet greyish-blue or plumbeous-blue to dull slaty, darker on the joints; webs blackish and claws black.

Measurements. Wing, ♂ 217 to 235 mm., ♀ 209 to 225 mm.; tail 45 to 63 mm.; tarsus 34 to 38 mm.; culmen about, ♂ 43 to 47 mm., ♀ 40 to 46 mm.

Weight 1¾ to 2½ lbs.

Female. A broad ring round the base of the bill white, sometimes mingled with brown on the chin; head, neck, upper breast and extreme upper back brown, blackish near the white forehead and with obsolete pale edges to the feathers; centre of back and scapulars brown with a certain amount of white speckling and vermiculations; rump and upper tail-coverts brown; tail dusky brown; wings as in the male but duller with white speculum restricted; flanks brown, much marked with white; abdomen white, changing gradually into the brown of the breast and not sharply defined from it; vent sooty-brown; under tail-coverts white, much mottled and marked with dark brown.

The colours of the soft parts are the same as in the male but duller.

Young males are like the adult female but have the white round the base of the bill much less in extent and sometimes almost entirely wanting; the plumage generally is a darker, rather richer brown.

Male in eclipse plumage. Similar to the female but with no white band round the bill, though the feathers of the lores and forehead are sometimes rather whitish; the upper parts are more vermiculated with white and the speculum is purer white and more pronounced; the under tail-coverts are white, vermiculated and tipped with black; the brown breast and white abdomen grade into one another and are not sharply defined.

Nestling. Upper parts olive-brown without the pale patches of the Common Pochard, except a pale patch on each side of the back, often obsolete; the underparts are creamy-yellow, more buff on the breast and throat and brown on the sides of the body and vent.

Distribution. The Northern Palæarctic region from Iceland to Eastern Siberia. In Winter South to the Mediterranean countries, Northern Africa, South-West Asia to Persia and India. In the last-named country it is a rare visitor only but has occurred from time to time in Kashmir, Kulu, Nepal, Attock, Gurgaon, ? Karachi and South as far as Panwell in Bombay, where Inverarity shot a female in 1884. In 1907 a fine male was purchased in the Calcutta bazaar and in the same year a young female was shot in Chittagong. In Oudh Gompertz shot eleven specimens between 1904 and 1907; in Dibrugarh Moore shot one, a young female, in 1904 and in this district I, myself, shot two others, one a fine male and the other a young bird of the same sex.

Nidification. The Scaup breeds in May and June but in its Northern area few birds lay until well on into the latter month. It is said to sometimes breed in heather, grass or other cover but the many pairs I saw breeding in Lapland were all breeding in dense flags or reeds and none in the more open moss and grass-lands where the Mallard and Pintail etc. bred in preference. The nests are well made of flags and rush-leaves, supported either by a tangle of broken-down reeds or by the close-set stems of those still growing, often in quite deep water. The first egg or two seem to be deposited on the flags without any down, but this is then plucked and placed in the nest very thickly and soon works under the eggs as well as forming a wall round them. The normal clutch numbers seven to ten, though much larger are sometimes laid. In colour they a dull olive-drab and vary but little in tint. One hundred and fifty eggs average 62·7 × 43·8 mm.: maxima 68·1 × 44·7 and 59·0 × 48·0 mm.; minima 54·3 × 41·5 and 66·3 × 40·7 mm. The Scaup is said to sometimes breed in colonies, several nests being built within a few yards of one another.

Habits. The Scaup derives its name from "Scaup" or "Scalp," the term used for the beds of mussels on which it is supposed to feed. Any mollusca are, however, taken as food in addition to crustacea, worms, larvæ, frogs, small fish, insects etc., together with a small proportion of vegetable food. It is a wonderful diver and swimmer, most of its food being obtained by diving, whilst it indulges in this as a sport as well, birds often chasing one another in play both on and under the water. It is a duck which in the non-breeding season prefers the sea to lakes and marshes and even when breeding is very partial to small islands. Its flight when once on the wing is strong but it is slow off the water and rises rather like a Coot; on land, also, it is awkward and walks clumsily and slowly. Its calls are very discordant and Seebohm likens its principal note to a man with an exceptionally harsh voice screaming "scaup" at the top of his voice. It is a poor bird for the table but varies considerably in this respect.

(2283) Nyroca fuligula fuligula.

THE TUFTED POCHARD.

Anas fuligula Linn., Syst. Nat., 10th ed., i, p. 128 (1758) (Sweden).
Nyroca fuligula. Blanf. & Oates, iv, p. 463.

Vernacular names. *Dubaru*, *Ablak*, *Rahwára* (Hind.); *Turándo*, *Runharo* (Sind); *Malac* (Nepal Terai); *Nella chiluwa* (Tel.); *Bamuniya-hans* (Assam).

Description.—Male. Whole head, neck, back, rump, tail, breast, wing-coverts, under tail-coverts and innermost flanks black; on the sides of the head there is a certain amount of green gloss, whilst the crest and neck have purple reflections; the back, scapulars and more or less of the wing-coverts have a very fine powdering of white. This is so fine as often to require careful looking for before it can be seen and is never coarse enough to have any effect on the general depth of tone; primaries dark brown, the inner web of the first whitish at the base, fading into brown elsewhere; on each succeeding primary the white increases in extent until on the innermost the whole inner web except the tip is white; in all the primaries the white and brown blend gradually and do not contrast; outer secondaries white with black tips; inner secondaries black, glossed with green; abdomen white, sharply defined from the black breast, but slightly mottled near the black flanks.

Colours of soft parts. Iris bright yellow; bill greyish-blue or greyish-slate to dull dark plumbeous, the nail and tip black; legs and feet the same as the bill; the joints darker and the webs almost black.

Measurements. Wing, ♂ 192 to 208 mm., ♀ 189 to 202 mm.; tail about 49 to 58 mm.; tarsus 33 to 37 mm.; culmen, ♂ 37 to 44 mm., ♀ 37 to 42 mm.

Weight, ♂ 1½ to 2¼ lbs., ♀ 1¼ to 1¾ lbs. One male shot in March and so fat that it burst when falling on the water weighed 2 lbs. 6 oz.

Female. Similar to the male with the black replaced by brown and the white of the abdomen grading into the brown of the breast instead of being divided sharply from it; the crown is generally but not always a good deal darker than the back and in some birds, probably very old, there is a greenish gloss on the sides of the head and neck. The depth of the brown colour varies greatly, whilst in some females the white parts are all tinged with rufous or buff, in some faint, in others very strong.

Males in eclipse plumage have the chin and throat mottled with white, the bases of the feathers showing; the black of the lower breast is fringed with white and the upper parts are duller and have the white powdering more developed. The colours of the soft parts are duller.

Nestling in down. Above dark brown, becoming dark sooty-yellow on sides of the head and neck, paler on the chin and throat, more brown again on the breast and yellowish-white on the abdomen; a darker brown moustachial streak.

Young males are like the female but the brown much darker, or blackish, and the wing as in the adult.

Distribution. The Palæarctic regions from the Atlantic to the Pacific whilst it apparently also breeds in the high lands of Abyssinia. In Europe it breeds as far South as the Balkans. In Winter it occurs throughout Northern Africa and throughout all Southern Asia to the islands of the Malay Archipelago. In India it is found in some numbers throughout the North from Sind to Assam, being very common in the latter province and Eastern Bengal. It is common in the Bombay Presidency, Deccan and Central India, South of which it becomes more rare and it has not yet been recorded from Ceylon.

Fig. 89.—Head of *N. f. fuligula.* ½.

Nidification. The Tufted Duck breeds in May and June, generally selecting a position for its nest in among flags or in reed-beds but sometimes in grass and moss or among bushes. It is very partial to islands in lakes, where these are swampy, as well as islands in the sea, for, like all Pochards, it is even more of a sea-bird than one of lakes and marshes. The nest is generally well made and nearly always well concealed, though the duck sits so close that she always gives away the nest as she flounders off it. The eggs number six to twelve, sometimes more, and vary more in tint than those of most Pochards. The majority are of the typical olive-drab, sometimes fairly clear and bright, but occasionally they are distinctly olive-buff in tone, almost the colour of 'Mallards' eggs. Two hundred average : 8·7×41·0 mm.: maxima 65·9×46·3 and 63·9×47·2 mm.; minima 53·0×38·0 and 63·9×37·2 mm.

Habits. In most of its habitat the Tufted Pochard frequents the sea as much as inland lakes and swamps but in India it may be found on almost any kind of water, preferring, perhaps, fairly deep lakes with dense cover all round and open water in the middle. It feeds on the same kind of food as other Pochards and resembles them in flight, swimming and in diving powers, whilst it is no less awkward on land. Its note is a harsh low croak, sounding like the word "kurr" rapidly repeated.

Genus GLAUCIONETTA.

Glaucionetta Stejneger, Proc. U.S. Nat. Mus., viii, p. 409 (1885).

Type by orig. desig., *Anas clangula* Linn.

In the genus *Glaucionetta* the bill is short, higher than broad at the base, not much flattened at the tip, tapering slightly throughout, more rapidly and rounded at the end; culmen very slightly concave; the nostrils are placed nearer to the tip than to the base of the bill, this being a feature found only in this duck; the lamellæ are short, stout and placed very close together; the tarsus is short and scutellate in front; the hind toe well developed with a broad lobe; the legs are placed far back, rendering the walk difficult and top-heavy; the wings are pointed; the tail long and strongly graduate.

The posterior end of the sternum is prolonged as in *Merganser*. Sexes differing.

This genus is a small one, containing three species, all Northern birds and all more sea birds than freshwater birds, except in the breeding-season, when they resort to inland lakes and marshes.

Only one species occurs in India and that only as a rare visitor.

(2284) Glaucionetta clangula clangula.

THE GOLDEN-EYE.

Anas clangula Linn., Syst. Nat., 10th ed., i, p. 125 (1758) (Sweden).
Clangula glaucion. Blanf. & Oates, iv, p. 464.

Vernacular names. None recorded.

Description.—Male. A large round white patch on the cheeks, adjoining the base of the upper mandible; rest of the head black, the crown, nape, hind-neck and sides of the head glossed with brilliant metallic green; inner and longer scapulars black; outer scapulars white, the longest black with a white bar across the middle; back, upper tail-coverts and tail black; outer secondaries and their greater and median coverts white; the rest of the coverts and quills black; chin and throat dull black; breast, lower neck and abdomen white; flanks white, the feathers edged with black; under wing-coverts greyish-black; feathers about vent with dark grey bases which show through; under tail-coverts white.

Colours of soft parts. Iris golden-yellow; bill black; legs and feet yellow with black webs. The bill in Summer is sometimes a slaty-blue with dark culmen and nail.

Measurements. Wing, ♂ 206 to 231 mm., ♀ 197 to 213 mm.; tail about 76 to 90 mm.; tarsus about 34 to 39 mm.; culmen, ♂ 30 to 37 mm., ♀ 28 to 32 mm.

Weight, ♂ 1¾ to 2¼ lbs., ♀ 1½ to 2 lbs.

Female. Head and neck brown, with a dull white collar round the base of the latter; upper parts blackish-brown, the feathers of the mantle with pale grey edges, those on the scapulars whiter; tail grey-brown; lesser wing-coverts dark brown; median coverts brown tipped with white; the greater coverts white tipped with brown; primaries dark brown; outer secondaries white; inner secondaries dark brown; upper breast, sides and flanks dark grey, the feathers broadly edged with white, in some cases the white covering most of the outer web; thigh-coverts and vent much mixed with mouse-brown; abdomen and under tail-coverts white, the latter more or less brown on the lateral feathers.

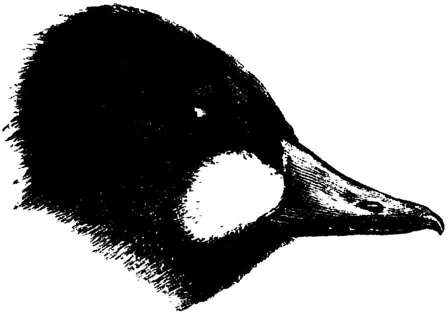

Fig. 90.—Head of *G. c. clangula.* ½.

Colours of soft parts as in the male but the bill is never black or slate but brownish-horny; the legs and feet vary a good deal but are always some shade of yellowish-brown, the toes and webs darker or blackish.

Young males are like the females but duller in general colour and have the breast-feathers more or less edged with whitish-buff or pale brown.

Male in eclipse plumage is like the female but always retains the full wing-colour, the pure white well-defined speculum alone sufficing to distinguish it from that sex.

Nestling in down. Upper parts blackish-brown; a white bar across the wing and a white spot on each side of the back near the centre; a second white spot on each side of the rump and a third just above the thigh; lower parts and sides of head and neck white, the breast, and sometimes round the vent, suffused with brown.

Distribution. Northern Palæarctic region, breeding in both the Arctic and Subarctic parts. In Winter it migrates to the countries round the Mediterranean; Asia Minor to Transcaspia and the whole of Southern Asia as far as Northern India and South Central China. In India it is a rare visitor. Barnes first obtained it on the Indus in Sind or the Punjab in 1860; in 1870 Bonavia obtained a fine male from fowlers near Lucknow; Stoker obtained three birds, all young ones, one at Hassanpur and two at Ghazi and, finally, a fourth, a fine drake, near Hassanpur; Barnes obtained another specimen in the Punjab; Yerbury obtained four specimens round about Attock in 1886; in 1903 Eden shot one in Sadiya, Assam, *and saw many*, recording also the fact that they are not uncommon above Sadiya. From 1905 to 1910 I saw Golden-eyes in some numbers in the streams debouching from the hills in Northern Assam, whilst in 1911 no fewer than six skins were sent to the Bombay Museum for identification, all having been obtained in North-West India.

Nidification. Normally the Golden-eye breeds during late May and all June, depositing its eggs in natural hollows of trees or occasionally, in holes in banks. It also often lays its eggs in nesting-boxes which the Finns and Laps put up for the purpose, whilst another very favourite site is under the huts which are put up everywhere in which to store grass or hay. These huts are all built on whole pine-logs, raised on stones or other logs, about a foot to two feet from the ground, leaving a hollow below where all sort of débris collects. Here the Golden-eye finds all sorts of holes and corners in which she can lay her eggs in perfect peace and safety, unless a Tufted Pochard has already taken possession. She makes little, if any, nest but the grey down she plucks from her own body is exceptionally thickly placed under and all round the eggs. These latter number anything from six to twelve and are in colour the greenest eggs of all the species of ducks which visit or breed in India. Two hundred eggs average 55·2×42·5 mm.: maxima **67·0**×39·5 and 60·0×**45·0** mm.; minima **52·0**×41·0 and 58·2×**39·2** mm.

Habits. Those of the Pochards. In the non-breeding-season it is a frequenter of the sea-coast but our visitors to India seem to be most often seen on swiftly-running clear-water rivers and streams. In the Subansiri and other rivers of Assam they were equally at home in the torrents and in the still, deep pools. They feed there almost entirely on fish, freshwater prawns and small mollusca, which is similar to their food when frequenting the coast, though a little vegetable may be added in the shape of seeds and shoots of aquatic plants. Their voice is a low croak but they are said to have a loud, harsh note during the breeding-season.

Subfamily ERISMATURINÆ.

This curious subfamily has two features which separate it very distinctly from all other ducks. The first is the bill, which has the base very much swollen, the swelling extending to the nostrils; the nail is very small and bent inwards. The second character is the tail, which consists of eighteen feathers, very narrow, stiff and pointed.

The subfamily consists of one genus, very widely distributed, of which one species occurs as a casual visitor within the limits of this work.

Genus **ERISMATURA.**

Erismatura Bonaparte, Giorn. Acad. Roma, lii, p. 208 (1832).

Type, *Oxyura jamaicencens* Gmelin.

The name *Erismatura* has recently been rejected by systematists for Bonaparte's earlier name *Oxyura*. This, however, cannot be used as it is preoccupied by *Oxyurus* of Rafinesque, 1814. This Bonaparte himself realized and therefore proposed the new name *Erismatura*.

In this genus the bill is large and very swollen at the base, the nail is small and curved inwards; the culmen is concave, the anterior part of the bill flat and broad and the lamellæ coarse and set far apart; the nostrils are large, oval and placed nearer to the base than to the tip of the bill; the tarsi are short and placed far back as in the diving ducks; the feet are large and the hind toe is broadly lobed; the wings are short and pointed. Sexes slightly different.

(2285) **Erismatura leucocephala.**

The Stiff-tailed Duck.

Anas leucocephala Scopoli, Annus I, Hist. Nat., p. 65 (1769) (No locality. North Italy).
Erismatura leucocephala. Blanf. & Oates, iv, p. 466.

Vernacular names. None recorded.

Description.—Male. Crown black, narrow forehead, sides of the head, including round the eye, chin, upper throat and nape white; a blackish ring round the neck just below the nape and upper throat; back, scapulars, rump and sides of body chestnut-rufous, sometimes tinged buff, finely vermiculated and speckled with blackish; upper tail-coverts dark chestnut; tail blackish; wings brown, the coverts and outer webs of the outer secondaries speckled with buff; breast and sides dull rufous-chestnut or ferruginous, irregularly barred with dull black; remainder of lower parts dull pale rufous-buff or buff, the dark bases of the feathers showing as bars or mottling; under wing-coverts grey, paler and whitish in the centre; axillaries white.

Colours of soft parts. Iris dark brown; bill pale slaty-ultramarine to bluish-plumbeous; duller in females and young birds; legs plumbeous-black, the webs and toes black.

Measurements. Wing, ♂ 160 to 168 mm., ♀ 150 to 157 mm.; tail about 95 to 101 mm.; tarsus about 34 to 37 mm.; culmen, ♂ 46 to 49 mm., ♀ 45 to 47 mm.

Female. Has the white on the face restricted to the chin, lower cheeks and a stripe from the gape towards the nape; the rest of the sides of the head is mixed with dull rufous; the upper tail-coverts are concolorous with the rump; the breast is a duller rufous and the black bars are obsolete or wanting.

Young males only differ from the females in being somewhat more richly tinted above.

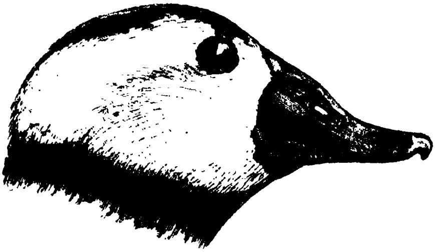

Fig. 91.—Head of *E. leucocephala.* ½.

Nestling in down. General colour greyish-brown, the upper parts of the head darker and browner; a paler grey streak from the base of the bill, running under the eye to the nape; chin, throat and upper part of neck greyish-white mottled with dusky; a pale grey spot behind the wings on each side; edge of wings and below them nearly white.

Distribution. The countries surrounding the Mediterranean and Western Central Asia, according to Finsch as far North as Southern Siberia, wandering North in Europe to Germany and Holland and straggling South in Winter to India. In this last country it occurs only as a very casual visitor. It was first recorded in 1879, when two were shot at Khelat-i-ghilzai by St. John; in 1886 Field shot one in Loodhiana and in 1882 Chill obtained three others near Delhi. Others have been recorded from Philibeet District (*Lean*); 1891, Halkote (*Burke*); 1896, Hardwur (*Davis*), three on the Ganges, Kadur (*Onslow & Campbell*); 1898, three specimens, Kashmir (*A. E. Ward*); 1907, several times in Kashmir; 1908, two immature, Noushera (*Tenison*); one, Sakkur (*Ommaney*); 1906–7, many seen Kohat (*Whitehead*); 1910–11, many seen and shot (*Logan Hume*); and 1916 (*Bailey*), and in the latter year five specimens were sent to the Bombay Museum from Langi-Nawar by Hotson. Since then other birds have been seen and shot almost yearly on the North-West Frontier and the bird must be a fairly regular visitor, though in very small numbers, to the extreme North-West and Kashmir.

Nidification. The Stiff-tailed Duck breeds during April, May and early June on inland ponds, lakes and marshes, making a nest of grass, rushes and weeds which is well concealed in dense grass or weeds but not in long reed beds. In some cases the nest is said to be thickly lined with pure white down but in others there is said to be little or no down at all. The eggs number six to ten, and are very unlike the eggs of most ducks in appearance. They are pure white, sometimes, it is said, faintly tinged with green and have a very coarse, rough texture, the surface slightly chalky and with no gloss. They are immense for the size of the bird, one hundred eggs averaging 66·8 × 51·1 mm.: maxima **72·5** × 50·5 and 68·5 × **53·5** mm.; minima **62·8** × 52·0 and 66·0 × **48·0** mm.

Habits. This curious little duck is almost more like a grebe than a duck in the way it swims, dives and flies. Swimming it can either ride lightly on the top of the water or it can move about wholly submerged except for its head and neck. When swimming it either carries its tail erect like a Wren or submerged so that it can be employed as a rudder when birds play about, looking, as Chapman and Buck describe them, more like a shoal of small porpoises than birds. When shot at they often prefer to escape by diving and swimming than by flying, though when well on the wing they get along at a fair pace. They rise from the water like grebes, skittering along the top for a long way before they get away from it. On land they are said to be singularly helpless and hardly able to walk. It is a freshwater species living on fish, frogs, worms, mollusca and crustacea.

Subfamily MERGINÆ.

In this subfamily the bill is not depressed but is subconical or subcylindrical; the tip is hooked; the lamellæ are replaced by tooth-like non-pliant serrations; the tarsi are placed very far back, the feet are large, the hind toe well developed and with a broad lobe. There are two genera represented in India.

Key to Genera.

A. Culmen not longer than tarsus; tail of sixteen feathers	MERGELLUS, p. 466.
B. Culmen much longer than tarsus; tail of eighteen feathers	MERGUS, p. 468.

Genus MERGELLUS.

Mergellus Selby, Cat. Gen. Subgen. types Birds, p. 47 (1840).

Type by taut., *Mergus albellus* Linn.

The genus *Mergellus* possesses a small occipital crest, smaller in the females than in the males; the bill is about as long as the head, tapering throughout, with the culmen nearly straight; the nostril is large, oblong and placed about one-third the length of the bill from the forehead; the serrations are coarse; the tarsi are very short, placed far back on the body, with a large foot; the tail is rounded and consists of sixteen or, occasionally, eighteen feathers; the wing is short and pointed; there is a single cæcum.

There is but one species, of which the sexes differ considerably

(2286) Mergellus albellus.

THE SMEW.

Mergus albellus Linn., Syst. Nat., 10th ed., i, p. 129 (1758) (Mediterranean Sea, Europe); Blanf. & Oates, iv. p. 467.

Vernacular names. *Nikenne* (Hind.); *Jhāli* (Sind).

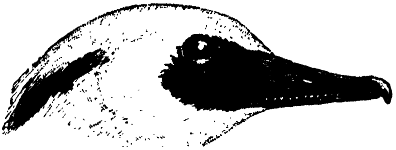

Fig. 92.—Head of *M. albellus*. ½.

Description.—Male. A large patch from the base of both mandibles to the back of the eye and including base of ear-coverts, black with green reflections; subordinate and lateral feathers of the crest the same, the black extending in a narrow line, more or less, on the sides of the head; a crescentic black band above the upper back, running down each side of the breast; back black, duller on the lower back and changing to brown-grey on the rump and upper tail-coverts, where the feathers are dark-centred; rest of head and lower surface white; primaries brown, dark-shafted above, white-shafted below; outer secondaries black with white tips, the next two or three white, the innermost silver-grey with dark shafts and white outer edges; greater coverts black, those over the secondaries tipped with white; median coverts white; the remainder black; scapulars white, the outer edged with black, giving them a barred appearance; a black bar across the base from the centre of the back, over the shoulders of the wings and down each side of the body: flanks white, very finely barred with black; under aspect of tail pale grey.

Colours of soft parts. Iris pearl-grey in very old birds, red or bright red in younger and brown and grey-brown in birds younger still; bill pale plumbeous, varying from a pale bluish to rather dark slaty, the nail darker and browner, but whitish at the extreme tip; legs and feet pale blue-grey to lavender or slaty-plumbeous, the webs slaty-black to black and the claws brownish-black.

Measurements. Wing, ♂ 190 to 205 mm., ♀ 178 to 190 mm.; tail about 70 to 77 mm.; tarsus 29 to 33 mm.; culmen, ♂ 27 to 30 mm., ♀ 25 to 29 mm.

Weight, ♂ 1 lb. 4 oz. to 1 lb. 12 oz., ♀ 1 lb. to 1 lb. 8 oz.

Female. The black loreal patch in the male is replaced by rich dark brown, almost black in very old females; the whole upper head, crest and nape ferruginous-brown, richest and reddest at the end of the crest; upper back grey-brown, changing to blackish-brown on the lower back and, again, to dark grey-brown on the rump, upper tail-coverts and tail; wing like those of the male but the innermost secondaries darker and browner, the lesser coverts brown instead of black; breast mottled grey; rest of lower plumage white, more or less mottled with dark brown; axillaries grey.

Colours of soft parts as in the male but the iris always brown.

Young males resemble the female but have no dark loreal patch and the crest is darker and duller; the white wing-patch is more or less suffused with brown and the breast is more spotted.

Males in eclipse plumage differ from the females in having the white wing-bar larger and the lesser wing-coverts darker; they also show the two black crescentic bands on the sides of the breast.

Nestling in down. Upper parts dark brown, including the sides of the head; a small white spot below the eye; there are also white spots on each side, one on the posterior edge of the wing and on the sides of the back just behind the wing, and, the second on the back near the rump; breast and flanks brown or dusky, remainder of lower parts white.

Distribution. Breeding in Northern Europe from North of the Baltic to East Northern Russia. It is said also to breed on the Volga and in Dobrudgea. In Winter it migrates to Southern Europe, North-West Africa to Egypt and to India, China and Japan.

Nidification. The Smew normally breeds during June and early July, making no nest but laying its eggs in natural hollows in trees standing by streams, lakes and marshes. The lining of down is very plentiful and, by the time incubation is advanced, the eggs are almost buried in it. Very often the bird makes use of one of the nesting-boxes which the Finns put up for Ducks to breed in, taking the first lot of eggs for food and allowing the second laying to be hatched. The eggs are generally eight to ten, often less and occasionally as many as thirteen or fourteen. In colour they are a pale creamy-buff, very smooth and satiny in texture, with a fine gloss. One hundred and thirty-seven eggs average 52·2 × 37·5 mm.: maxima **58·0** × **40·5** mm.; minima **47·7** × **34·0** mm.

Col. A. E. Wards records finding this duck breeding at Shyok, in Ladak.

Habits. The Smew is a regular visitor in small numbers to the North-West of India and it has been found as far South as Cuttack, Raniganj in Bengal, and Hazaribagh in Chota Nagpur. In Assam it is not common. and I seldom met with it, though both Stevens and Coltart found it on the streams where they debouched from the foot-hills. In Europe it is as much a sea bird as a freshwater bird, or even more so in the non-breeding season but here in India it seems always to be found in small flocks on quickly-running, clear-water streams. Its food consists chiefly of fish but it also eats small crustacea and mollusca, all sorts of larvæ, worms and insects and, it is said, occasionally a little vegetable food. It is a wonderful swimmer and diver and is faster on the wing than the true Mergansers, having a noiseless flight, which it makes with very rapidly-beating wings. Its call is a harsh "kir-r-r," uttered frequently during the breeding-season but seldom at other times.

Most of our Indian visitors are immature birds.

Genus **MERGUS.**

Mergus Linn., Syst. Nat., 10th ed, i, p. 129 (1758).

Type by orig. desig., *Mergus merganser* Linn.

The genus *Mergus* differs from *Mergellus* in its much longer bill, which is narrow, strongly hooked at the tip, with a nail occupying the whole width of the bill; the serrations are strong, wide apart and set with their tips pointing backwards; the nostril is situated between one-quarter and one-third the length of the bill from the base; the wings as in *Mergellus*; the tarsus short and strong and placed very far back as in that genus; the feet large; the tail of eighteen feathers cuneate; there are two cæca.

Sexes different.

The genus is found throughout the Northern Hemisphere, two species entering India, though one is of the greatest rarity.

Key to Species.

A. Head and neck black glossed with green. (Adult males.)	
a. Lower parts white throughout, or merely flushed with rosy	*M. merganser*, p. 469.
b. Upper breast rufous with black marks	*M. serrator*, p. 473.
B. Head and upper neck rufous. (Adult females and young males.)	
c. Chin white; back grey	*M. merganser*, p. 469.
d. Chin streaked with rufous; back brown	*M. serrator*, p. 473.

Mergus merganser.

Key to Subspecies.

A. Rather larger; wing ♂ 283 to 298 mm.; lower back and rump darker grey	*M. m. merganser*, p. 469.
B. Rather smaller; wing ♂ 243 to 284 mm.; lower back and rump paler grey	*M. m. orientalis*, p. 472.

(2287) Mergus merganser merganser.

THE GOOSANDER.

Mergus merganser Linn., Syst. Nat., 10th ed., i, p. 129 (1758) (Sweden).
Merganser castor. Blanf. & Oates, iv, p. 469.

Vernacular names. None recorded.

Description.—Male. Whole head, upper neck and long crest of narrow feathers black glossed with metallic green, showing purple in a bright light; the centre of the chin and throat glossless; lower neck and underparts white; upper back glossy black; lower back, rump and upper tail-coverts grey, much vermiculated with white, especially on the sides; the tail-coverts have dark shafts and sometimes paler edges; tail silvery-brown, paler and more grey on the under aspect; primaries and outer secondaries very dark brown; inner secondaries white, with a narrow edging of black on the outer webs; greater secondary coverts white with black bases; primary coverts and edge of wing black; remaining coverts white; outer scapulars white with narrow black margins; the inner scapulars all black, one or two of those next the white ones being tipped with white and having irregular narrow white edgings.

In life the whole of the white underparts are suffused with a beautiful rosy-salmon, often very pronounced on the breast; this colour unfortunately fades very quickly after death and is therefore not apparent in museum specimens.

Colours of soft parts. Iris carmine or deep red, sometimes tinged with brown in the younger birds; bill vermilion, the nail black and sometimes the culmen rather dusky, especially in the non-breeding season; legs and feet bright vermilion.

Measurements. Wing 283 to 298, once 300 mm.; tail 104 to 115 mm.; tarsus about 46 to 51 mm.; culmen 55 to 63 mm.

Female. Chin and throat white; the lores albescent-rufous; rest of head and neck dull rufous, the crown more brown; primaries and first few secondaries dark brown; the next few white and the innermost grey with dark margins; upper parts grey, rather mottled in appearance and the upper tail-coverts with dark shafts; tail grey-brown with darker, browner shafts; some of the scapulars very dark brown; the lesser and median wing-coverts mottled grey and greyish-white; sides of neck and whole lower surface white, the flanks striped with grey.

Colours of soft parts as in the male but all duller; the irides always brown.

Measurements. Wing 251 to 272 mm.; culmen 45 to 53 mm.

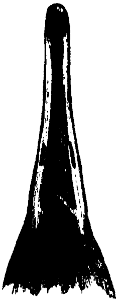

Fig. 93.—Bill of *M. m. merganser.* $\frac{1}{2}$.

Young males are like the female but have shorter crests whilst the markings on the flanks are brown instead of grey; the dark and light of the scapulars contrast more. According to Witherby the scapulars of the young male are much longer than in the young female.

Colours of soft parts. Iris brown; bill orange-red, the tip and culmen dusky and the under mandible sometimes fleshy or yellowish-red; the legs and feet are orange-red or sometimes even orange-brown.

Males in eclipse plumage resemble the female but retain the white wing-coverts; generally the centre of the neck and breast are white; the soft parts are less brilliantly coloured than in the breeding-season.

Nestling. Upper parts brown or grey-brown, the crown and neck tinged with rufous and the rump and back darker and more brown than the sides; a white patch on the wings and a second on each side of the rump; a third joining the white of the underparts on each side of the back; a dark streak through the eye; a small white patch above the eye, indefinite and often tinged tawny.

Distribution. Iceland and North Europe to Kamschatka; moving in Winter South to Northern Africa and South Asia. In India this bird occurs in Sind and on the Mekran coast but all the specimens occurring in the Himalayas, sub-Himalayas and Northern India appear to belong to the smaller Eastern race. A specimen from Oude has a wing of 298 mm. and must be of the Western race and another, equally big, from Bombay is the same.

Nidification. The Goosander breeds from the end of April in the most Southern latitudes to the middle or even end of June in the most Northern. The bird chooses as a site either a natural hollow in a tree, a hole in rocks, a rabbit-burrow or just a hollow in long grass or heather. The nest itself is of the slightest; when in a hole there is often nothing beyond the thick lining of greyish-white down, whilst even when made in grass and heather it consists merely of the beaten-down herbage with a few scraps of dry grass added. The eggs number six to fourteen, most often seven or eight and are a creamy-white to pale buff, distinctly lighter and paler than those of the Red-breasted Merganser. One hundred and fifty eggs average 68·3 × 47·1 mm.: maxima **74·5** × 47·5 and 70·0 × **49·0** mm.; minima **63·0** × 45·0 and 68·0 × **41·0** mm.

In Finland, where all the small farmers keep a series of boxes round their farms for the ducks to breed in, this species often occupies them. The same is the case in the small islands round about the entrance to Helsingfors, where, however, the bird is not common.

Habits. This Goosander during the non-breeding-season is more of a sea than freshwater bird. It lives almost entirely by fishing and when thus employed comes a long way up rivers and streams and sometimes does an enormous amount of damage to fisheries. It is a most voracious feeder and during a day will easily devour and digest 100 small fish, for it generally confines itself to those of three to five inches, though when hungry it will take and swallow fish of much larger size. Under pressure Gossanders will also eat frogs, insects, larvæ, worms etc. They are among the most expert of divers and swimmers. Normally they swim rather high in the water but they can at will sink themselves so that only the back is out of water or merely the head and neck. They often fish in company and then unite in forming a semicircle, driving the fish before them into a shallow, where it is more easy to capture them. They rise off the water slowly, splashing along the surface for some way, but once in the air can fly at a great pace. Their ordinary voice is a low, harsh croak but during the courting-season the male has a plaintive, soft whistle, which is also uttered by the female and young.

(2288) Mergus merganser orientalis.

THE EASTERN GOOSANDER.

Mergus orientalis Gould, P. Z. S., 1845, p. 1 (Amoy, China).
Merganser castor. Blanf. & Oates, iv, p. 409 (part.).

Vernacular names. None recorded.

Description. The Eastern Goosander differs from the Western bird principally in being distinctly smaller; in addition the male has the black on the inner secondaries and scapulars greater in extent, the lower back and rump are paler grey and more thickly freckled with white; the crest is also usually thinner and more scanty but this is not always the case, the salmon-pink tinge on the lower plumage is very pronounced.

Colours of soft parts as in the typical form.

Measurements. Wing, ♂ 243 to 284 mm., ♀ 189 to 257 mm.; culmen, ♂ 49 to 54 mm., ♀ 40 to 47 mm.

Males in eclipse, young males and females differ from the adult male in the same way as they do in the preceding bird.

Nidification. The Eastern Goosander breeds on the larger lakes of the Himalayan plateaus in May and June. Osmaston says it breeds regularly in Ladak, on the lakes in Rupshu and the Pangong Lake in late June, and that it also breeds on the Indus at about 13,000 feet. In Tibet it breeds in great numbers between 12,500 and 15,000 feet on or near most of the larger lakes. Here the birds breed in holes in cliffs and steep, high banks, sometimes at considerable distances from the water. Two nests obtained for me near Hram-Tso Lake were made in hollows or crevices in rocks in a crumbling cliff. There appears to have been no material in either of the hollows, though there was a good deal of rubbish, moss, earth etc. filling up the bottoms below the eggs, which rested in very thick beds of down which completely buried them. The down when sent home was half, the part which formed the walls, clean and fluffy; the other half, forming the bed, full of moss, dirt etc. and required much cleaning and baking. When cleaned it became a pale grey, of the same very fluffy character as that of the Common Goosander Each nest contained seven fresh eggs, one being taken on the 7th and the other on the 8th of June. The eggs are like those of *M. m. merganser* but smaller. Twenty eggs average 64·6 × 44·8 mm.: maxima **67·0** × 44·2 and 64·0 × **45·0** mm.; minima **62·8** × 44·8 and 64·0 × **43·5** mm.

Habits. The Eastern Goosander is a not very common resident from Afghanistan and Baluchistan to Kashmir, occurring in corresponding numbers in Winter on the plains immediately adjacent. From Ladak to Setchuan it is a very common bird and in Winter visits the foot-hills of Behar, Sikkim, Bhutan and Assam in very large numbers, though these diminish rapidly as the plains extend into Bengal, Orissa and Burma. In Assam Goosanders associate mostly in small flocks of a dozen to thirty or forty birds, but these collect in the early mornings and evenings and together wend their way down to their fishing-ground, so that several hundred may be seen passing up and down a river in a very short time. They seem to be equally at home in the deep slowly-moving pools or in the wildest torrents and it is a most beautiful sight to see a party of these birds playing in either kind of water. At other times they may be seen fishing, a whole party working in concert, forming a wide semi-ring and driving the fish into a backwater. Although the birds dash hither and thither, both on and under water, with almost incredible speed, the formation is never broken and the end is always a holocaust of small fish after the shallows are reached. The gorging ended, the birds sit on some sand-bank so full that when disturbed they have to disgorge before moving. They run well on land in a very upright position but if pressed tumble about in all directions and, normally, they prefer to shuffle along on their breasts down to the water. They are very wary birds and even when replete one or more are always on sentry duty to warn the flock on the approach of danger.

In Assam they keep entirely to swiftly-flowing rivers but after they reach the land of sluggish, muddy waters they take to the clearer lakes and ponds if such are to be found.

(2289) Mergus serrator.

THE RED-BREASTED MERGANSER.

Mergus serrator Linn., Syst. Nat., 10th ed., i, p. 129 (1758) (Sweden).
Merganser serrator. Blanf. & Oates, iv, p. 470.

Vernacular names. None recorded.

Description.—Male. Whole head, crest and a narrow line down the back of the neck black; the posterior part of the head and neck glossed green; neck white; back black; lower back, rump and upper tail-coverts white and very dark brown in wavy lines; the bases of the feathers on the lower back brown and showing a good deal; tail dark grey, the feathers edged paler; the three outer primaries and the innermost secondaries dark brown; the fourth primary white with a black base; the next two or three the same but the black decreasing and from these to the longest secondary white with narrow black margins; greater and median coverts white; edge of the wing and smaller coverts brown; breast rather rich rufous-brown, the feathers more or less centred black; the sides of the breast under the shoulders of the wing black, with a patch of feathers white, merely margined with black; outer scapulars white, inner black; flanks and sides of breast finely vermiculated black and white or black and grey; remainder of lower plumage white.

Colours of soft parts. Iris carmine or red-brown; bill orange-red to deep vermilion, the edge of the culmen and nail black: legs and feet orange-red to bright vermilion, the joints generally darker and sometimes dusky, the webs darker and dusky, the claws light grey, duller and browner at their bases.

Measurements. Wing, ♂ 244 to 252 mm., ♀ 217 to 231 mm.; tail 79 to 88 mm.; tarsus 40 to 45 mm.; culmen, ♂ 53 to 62 mm., ♀ 48 to 55 mm. Two adults obtained in India have wings approximately of 253 and 254 mm.

Weight, ♂ 1¾ to 2¼ lbs., ♀ under 2 lbs. I have been able to obtain very few recorded weights and it is probable that many birds much exceed these figures.

Female. Lores and upper parts of head pale rufescent-grey, with darker centres to the feathers; a faint supercilium dull rufescent-white; a dark streak below the lores; chin and throat rufescent-white; remainder of head and neck dull rufous; upper parts ashy-brown, most of the feathers edged paler; primaries and innermost secondaries dark brown; outer secondaries and their coverts white, the latter with brown bases: remainder of wing-coverts ashy-brown; lower parts white; the flanks mottled brown and white; under wing-coverts grey and white.

Colours of soft parts as in the male but all duller. The iris is brown or red-brown, sometimes dull carmine; the bill is duller, more orange-red with the culmen dusky over a greater area; the legs and feet are more orange-red and paler than in the male.

Male in eclipse plumage like the female but with the colours of the wing retained as in the breeding-plumage.

Young males are like the female but the general tint more brown and less grey. The crest is shorter and all the soft parts still duller in colour.

Nestling in down like that of the Goosander but rather dark and sometimes a richer brown above.

Distribution. The Northern Hemisphere, Greenland, Iceland, Faeroes, Scandinavia, Northern Russia and ? Northern Asia, its Eastern limits not being definitely recorded. In Winter it occurs in America, South to Lower California and Florida; Northern Africa, Central West Asia to North-East India, China and Japan. In India there are only four authenticated instances of its occurrence. The first specimen was obtained by Yerbury in the Karachi harbour in 1877; a second specimen was purchased in the Calcutta bazaar in December 1889; a third, a young male, was shot by Captain Macnamara near Pishin in 1908. The fourth was obtained at Khushdil in 1902. This is recorded in the Journal of the Bombay Natural History Society by Ticehurst, who adds: "A not uncommon visitor in small flocks to the Mekran coast, keeping much to the bays."

Nidification. The Red-breasted Merganser breeds during May and June, but a few birds lay in early July in the extreme North, whilst eggs, probably a second laying, have been taken in August. This duck, unlike the preceding, does not breed in hollow trees and never makes use of egg-boxes but constructs a rather large compact nest of moss, grass and other bits of herbage. The lining is of grey down, but this is not only used to surround and lie beneath the eggs but a good deal is also incorporated in the body of the nest. This is placed either in among dense cover of bushes, heather or long grass or, at other times, it is built in rabbit-burrows, holes in banks or cliffs or under overhanging boulders. The eggs are a much deeper buff than those of *M. m. merganser* and are often tinged with a drab grey ; occasionally they are tinged with dull olive-green, whilst, very rarely, they are of a pale creamy-buff. Two hundred eggs average 64·9 × 44·9 mm.: maxima **70·0** × 44·7 and 64·5 × **47·3** mm.; minima **60·0** × 45·2 and 65·0 × 40·3 mm. The duck sits very close and has the habit, very common among ducks, of evacuating over her eggs, if startled off them.

Habits. The habits of the Red-breasted Merganser are much the same as those of the Goosander, though it is more exclusively a sea bird and, even on migration, apparently seldom wanders far from the sea-coast. On the coasts of the Baltic, though it may be met with on small islands a considerable distance from the mainland, its favourite resorts are the deep inlets of the sea which meander far into the coast-line. These often have a dense fringe of reeds and little backwaters, silent and still, with weeds covering their surface. Here the Mergansers are common and many nesting-sites are given away by the sight of the male swimming up and down the coast whilst his wife sits on her nest somewhere not very far away. In flight, swimming and diving powers etc. they are quite typical of the genus and they are as destructive to fish as are the Goosanders.

Order XV. PYGOPODES.

The last order of Indian birds to be described contains the Loons or Divers (*Colymbidæ*) and the Grebes (*Podicepidæ*). The former of these families is, so far, represented in India only by the occurrence of a single specimen of the Black-throated Diver, *Colymbus arcticus*. The two families, though superficially not unlike, have the feet utterly different and by some systematists are still kept in separate orders.

In this Order the skull is schizognathous and holorhinal; the nostrils pervious; basipterygoid processes wanting; the plumage is very short and dense, the lower plumage especially having remarkable wet-resisting properties; an aftershaft is present; the feathering of the neck is continuous; the wing is aquincubital; an oil-gland is present and tufted; cæca are present; the posterior border of the sternum has one incision on each side; the flexor tendons are the same as in the *Anseres*.

The anterior proximal (cnemial) process of the tibia is greatly developed, being very high and pyramidal; the legs are situated very far back, the tarsus is strong and compressed, the tail is very short and completely concealed by the coverts.

Key to Families.

A. Toes furnished with broad lateral lobes not divided into sections	**Podicepidæ**, p. 476.
B. Toes completely connected by webs reaching the tip of each	**Colymbidæ**, p. 485.

Family PODICEPIDÆ.

In this family the front toes are furnished with broad lateral lobes coalescing at the base and not contracted at the joints of the digits as in the Coots; the hind toe is small, raised and with a broad lobe; the fourth toe is longest; the nails are broad and flattened; the cervical vertebræ number 17 to 21, of which the first to the fourth are anchylosed; the angle of the lower jaw is not produced; there are twelve primaries, the first rudimentary; ambiens muscle wanting, accessory femoro-caudal and semi-tendinosus present but not the other characteristic thigh-muscles; only the left carotid is developed.

Sexes alike. Young hatched covered with down and able to swim at once.

This family is distributed over Europe, Asia and America, and three genera are now usually admitted, of which one only is found in Europe and Asia, three species of which occur in India, two resident and one a visitor in the Cold Weather.

Genus PODICEPS.

Podiceps Latham, Gen. Synopsis Birds, Suppl., i, p. 294 (1787).

Type by orig. desig., *Colymbus cristatus* Linn.

In this genus the bill is straight, compressed and sharply pointed; the oblong nostrils are placed close to the base; the tail consists of short downy feathers, difficult to detect among the coverts; the tarsus is much compressed and is covered with scutellæ in front and with serrations behind. The wings are very small, yet the birds have considerable powers of flight and some are highly migratory.

The young in down are striped.

Key to Species.

A. Wing 176 to 211 mm.; head in adult furnished with full ruff of elongated feathers	*P. cristatus*, p. 477.
B. Wing 123 to 127 mm.; sides of head in adult decorated with long hair-like plumes from eye to neck	*P. nigricollis*, p. 480.
C. Wing 94 to 109 mm.; adults without any decoration of long feathers on head or neck.	*P. ruficollis*, p. 481.

(2290) Podiceps cristatus cristatus.

THE GREAT CRESTED GREBE.

Colymbus cristatus Linn., Syst. Nat., 10th ed., i, p. 135 (1758) (Sweden).
Podiceps cristatus. Blanf. & Oates, iv, p. 473.

Vernacular names. *Shiva-Hans* (Assam).

Description. Forehead, crown and crest black; a line from the eye to the gape blackish; lores and sides of the head, chin and throat white, sometimes tinged rufous on the upper parts next the crown; the white changes to deep rufous on the base of the collar and this again to black on the longest feathers of the ruff; back of neck and upper plumage dark brown; outer scapulars white, sometimes mixed with rufous; lesser wing-coverts brown, often much mottled with rufous; other coverts, primaries and inner secondaries dark brown; outer secondaries white, those next the dark inner secondaries sometimes marked with rufous-brown; lower plumage silky white; sides of breast and flanks mottled brown and rufous; axillaries and under wing-coverts white.

Colours of soft parts. Iris carmine-red, crimson with a narrow inner ring of orange or orange with an inner ring of pale yellow; bill dark brown, the tip paler and slaty-grey, the extreme base suffused with crimson, obsolete in Winter; legs and feet olive-green externally, yellowish-green inside; webs yellowish, the nails bluish.

Measurements. Wing 176 to 211 mm.; tarsus 52 to 64 mm.; culmen 45 to 53 mm. (Very few skins in the British Museum collection are properly sexed and it is therefore impossible to show to what extent the sexes differ in size.)

Young birds have no crest or ruff; the upper parts are pale brown, each feather edged paler; the flanks are much less marked with brown and the rufous is absent or obsolete; the rufous on the head is replaced with white.

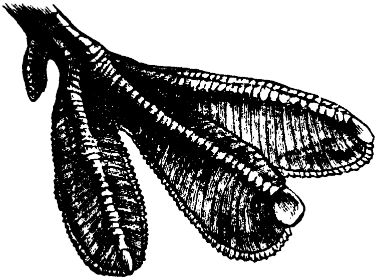

Fig. 94.—Left foot of *P. c. cristatus*. ½.

In an intermediate stage the ruff is indicated by longer feathers on the throat and fore-neck, mixed white and rufous at the base and blackish at the tips; the crest does not appear until the ruff is well advanced.

Nestling. Head and neck striped black and white, the stripes on the head broken and with a cross line over the crown; back striped blackish-brown and buffy-white; underparts white; wings brownish-black.

Distribution. Breeding over the greater part of Europe and throughout Northern and Central Asia to the Himalayas; Northern Africa, where it is resident. Northern birds migrate South in Winter to the Mediterranean countries, Northern Africa, Mesopotamia and Northern India.

In India it only occurs in the North. It is said to be not uncommon along the sea-coast; it breeds in Kashmir, though rarely and in great numbers in Ladak and Tibet. It is found in the Cold Weather in Oude, Behar, Bengal and Assam and a few pairs remain to breed. In Burma it seems to be rare but Oates obtained a specimen in Myitkyina and Harington another near Bhamo.

Nidification. In Europe the Crested Grebe breeds from May to July and often several nests may be found on the same piece of water, whilst in Ladak and Tibet it breeds in colonies, many birds placing their nests within a few feet of one another. In one place on the Hram-Tso Lake, Ludlow mentions finding on the 7th of July a colony of about fifty pairs, in addition to which there were several other colonies on the same lake. The nest is a mass of rush-leaves and weeds, semi-floating on the water and partially supported by growing reeds and floating plants. The bird leaves the nest at the slightest sign of danger, quickly covering the eggs with weeds and then sliding gently into the water, not reappearing until she has dived some hundred yards or so from the nest. When thus left the nest looks like a wind-blown pile of rubbish and would certainly escape the attention of the uninitiated.

Its breeding in the plains of India seems to be irregular. It certainly breeds in the plains of Assam, North of the Brahmapootra; some years two or three pairs may be seen in June, July and August, whilst in other years not a bird is to be found. It has been recorded as breeding in Karachi, Oude and the Doab, but all these instances seem to be abnormal and have not recurred. The eggs number three or four, rarely five, though six or nine have been recorded. They are white with a chalky, porous texture and very soon become soiled and discoloured, eggs that have been some time in the nest becoming wholly brown, whilst others become brown on one side, remaining white on the other. Jourdain gives the average of one hundred British eggs as 54·8 x 36·7 mm.: maxima **62·7** x 37·8 and 46·5 x **39·0** mm.; minima **46·5** x 39·0 and 55·3 x **34·0**.

Habits. The Crested Grebes prefer wide stretches of water in marshes, lakes or the actual sea, being seldom seen in small pools or village ponds and only on rivers whilst migrating. They are comparatively common birds in the huge swamps of Assam, keeping for the most part to open water, where they spend their time diving after fish. They also eat frogs, water-insects, larvæ etc. and, like all Grebes, swallow a number of their own feathers, possibly as an aid to digestion, instead of grit. They are extraordinarily expert divers, staying under water longer than Pochards, progressing faster and diving for greater distances. On the wing they fly fairly well when once started but before rising paddle along the top of the water for a long distance. As a means of escape they prefer diving to flying and to hit a Grebe as it shows its head for a second above water requires a smart shot. On land they normally move by pushing themselves along on their breasts. They are loth, however, to resort to land at all, though very occasionally they may be seen basking on a bank. Their cry is a harsh "krek-krek," whilst in the courting-season they utter a sort of bark as well as a hoarse croak.

(2291) Podiceps nigricollis nigricollis.

THE BLACK-NECKED GREBE.

Podiceps nigricollis Brehm, Handb. Natur. Vög. Deutchl., p. 963 (1831) (Deutchland); Blanf. & Oates, iv, p. 474.

Vernacular names. None recorded.

Description.—Breeding plumage. A line of long, silky, hair-like feathers commencing behind the eye and running down the neck, rufous at the base, changing to gold and then to palest glistening gold at the tips; rest of head and neck black; the feathers next the neck-tufts longer than the others; upper parts dark brown; wing-coverts dark brown; primaries paler brown, the inner with white tips and white on the inner webs extending to the outer webs on the innermost; outer secondaries white; inner secondaries and scapulars blackish-brown; below shining silky white; sides of the breast and flanks chestnut, mottled with brown; round about vent mottled brown and white.

Colours of soft parts. Iris red-brown or wholly vermilion-red in breeding-season in old males; bill black with the extreme tip horny-white or all black; legs and feet blackish on the outer parts, feet and webs grey, plumbeous or olive-plumbeous on the inner sides.

Measurements. Wing 123 to 137 mm.; tarsus about 20 to 26 mm., generally 21 to 24 mm.; culmen 39 to 43 mm.

Non-breeding birds have no lengthened rufous and gold feathers from the eye to the neck; the chin and throat are white or mixed black and white; the upper parts are brown, the head, neck and back concolorous, the scapulars and inner secondaries sometimes blackish; the sides of the breast and flanks are white like the abdomen, occasionally with a little brown mottling on the latter.

Young birds have the chin and throat pure white and the fore-neck and extreme upper breast dull grey; in other respects they resemble the adult in Winter plumage.

Nestling. Upper parts blackish, the stripes on the back ill-defined, the paler ones hardly showing; on the head the black stripes are broader, the pale stripes more fulvous-grey or fulvous-buff and not contrasting strongly with the black; sides of head and neck with more sharply contrasting black and white streaks, the latter on the neck and sides of the throat broken into spots; abdomen white, all round flanks and vent blackish-brown, flecked with white on the flanks.

Distribution. From Denmark and Southern Scandinavia throughout Europe and temperate Asia to China, Japan and India. Hume records it as not uncommon off the Mekran coast, Ticehurst obtained two specimens and saw another on the Manchar Lake, Meinertzhagen obtained it in Baluchistan and Finn procured a live bird in the Calcutta market.

Nidification. The nearest place to India in which the Black-necked Grebe has been recorded as breeding is Baluchistan, where Meinertzhagen found it nesting. In Europe it breeds during May and June or, occasionally, in April. It makes a nest quite typical of the family, a floating pad of grass and weeds but, unlike the Crested Grebe, it seems to prefer dense reed-beds as sites for its nest rather than the more open, weed-covered water. It lays normally three to five eggs, though as many as eight have been recorded. They are like those of the Crested Grebe, though much smaller. One hundred eggs (*Jourdain*) average 43·9 × 30·2 mm.: maxima **48·5** × 32·0 and 40·0 × **34·0** mm.; minima **39·0** × **27·1** mm. In parts of the Continent where the Black-necked Grebe is very common it breeds in small colonies. As with all the Grebes, both parents take part in incubation, whilst the male often sits on the nest with the female when she is sitting.

Habits. The food of these Grebes is said to consist principally of insects, Coleoptera and Hymenoptera forming the larger part. They also eat fish, frogs, worms, larvæ, mollusca and crustacea, whilst the young, according to Oldham, are fed entirely on fish. Their call-note is said by Witherby to be a soft "pee-ep," the courting-note a rippling "bidder-vidder-vidder-vidder" and the alarm-note a sharp "whit-whit."

Podiceps ruficollis.

Colymbus ruficollis Vroeg, Cat. d'Ois., Adum., p. 6 (1764).

Type-locality: Holland.

The typical form found in Europe has more black on the chin; the white on the base of the primaries and the secondaries is less in extent.

The Indian form, *albipennis*, is now generally considered indistinguishable from the African form *capensis*. Some specimens from Africa certainly have the upper parts very black but a few Indian specimens closely approach them in depth of colour and there is so much overlapping that it seems advisable to retain them for the present under the one name. Comparison of series of *breeding* birds may show that division is necessary.

The Philippine form, which might possibly wander into Southern Tenasserim, has chestnut under the eye instead of black and is darker above with a longer bill.

(2292) Podiceps ruficollis capensis.

THE INDIAN LITTLE GREBE.

Podiceps capensis Salvadori, Ann. Mus. Civ. Gen., (2) i, p. 252 (1884) (Shoa, Africa).
Podicipes albipennis. Blanf. & Oates, iv, p. 475.

Vernacular names. *Pandub*, *Pantiri*, *Dubdubi*, *Churaka* (Hind.);

Dubari (Beng.); *Munu-gudi-kodi* (Tel.); *Mukel-pan* (Tam., Ceylon) *Tubino* (Sind).

Description.—Breeding plumage. Forehead, crown and a narrow line down the hind-neck blackish-brown; lores, face and chin blacker; upper plumage dark brown, a little lighter than the crown; primaries light brown, the concealed, or nearly concealed, bases white and the inner webs white diagonally on the basal two-thirds; outer secondaries white, sometimes practically pure white, at other times in varying degree edged with very pale brown; sides of head, the neck and throat chestnut, deepest on the sides of the head, palest on the centre of fore-neck; lower parts silky white, the breast, flanks and round the vent much mottled with brown and sometimes almost wholly of this colour.

Colours of soft parts. Iris red-brown or deep red; bill black, the extreme tip pale and the base and gape yellow to pea-green, generally greenish-yellow; legs and feet greenish-black to almost quite black.

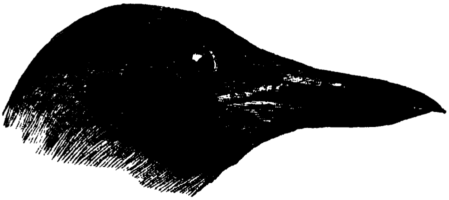

Fig. 95.—Head of *P. r. capensis.* 1/1.

Measurements. Wing 94 to 109 mm.; tarsus 30 to 35 mm.; culmen 18 to 22 mm. In the British Museum collection there are practically no sexed specimens.

In non-breeding plumage the crown and neck are concolorous with the back; the chin is white and the chestnut neck etc. replaced by pale rufous. Birds which breed very late in the year retain their breeding plumage up to and into December.

Young birds are paler, have no chestnut or merely a trace of it on the sides of the head and lower neck; the lower plumage is white with very little brown.

Nestling. A small very dark replica of the nestling of the Crested Grebe; the blackish stripes are broader, the pale stripes narrower and more fulvous or rufous; the chin and throat are much more black, the two pale stripes much less defined; a short white streak behind the eye; centre of abdomen white, the sides of the breast, abdomen and the vent black.

Distribution. A great portion of tropical Africa, from the Gold Coast and Abyssinia to the Cape; Madagascar and the Comoro Islands; Palestine, Arabia, Mesopotamia to India, Ceylon and

Burma. In these last three countries it is found practically everywhere and extends to Yunnan, where it was obtained by Anderson, and to Siam, where Herbert obtained several specimens.

Nidification. The Indian Little Grebe breeds in Ceylon during January and December and again in June; in Kashmir it lays in May and in Southern India the usual time seems to be May and June, whilst over Northern India, Assam and Burma the favourite months are August and September. Any piece of weedy water will suffice as a nesting-site and tiny village ponds or even roadside ditches have been selected for the purpose but the most common breeding places are fairly large stretches of weed-covered water in swamps more or less surrounded by reeds. In Cachar and Sylhet they breed in small colonies as well as singly and there are also colonies on the Nilgiris, in the Manchar Lake and one or two other places. For the most part, however, they make their nests singly and each pair of birds has its own domain, though this may be small where the birds are numerous. The nest is very crude; a little pad of weeds, supported by growing weeds, lotus and lily-plants, often half submerged and nearly always soaking wet. The nest is never in quite open water, in which it would either soon sink or be driven ashore with the first wind; on the other hand, it is sometimes, especially in Kashmir, built among the reeds surrounding the lakes. Both birds take part in incubation and often both sit together when the nest is large enough, whilst, always, before leaving their eggs they carefully cover them with more wet weeds. The eggs number three to five, but six and even seven are not uncommon, Betham once finding eight in a nest. In appearance they are miniatures of those of the Crested Grebe and, like them, are pure white when first laid but soon become stained and brown, sometimes to a dark mahogany. Two hundred eggs average 35·4×25·2 mm.: maxima **40·0**×24·0 mm. and 35·5×**26·5** mm.; minima **29·1**×23·4 and 35·1×**23 1** mm. Like other Grebes these do not sit close, diving noiselessly from their nests as soon as they have any idea of danger. On returning they do so by successive dives, after each dive searching round well for danger before once more diving in the direction of their nests.

Habits. The Little Grebe may be found anywhere where there is water. In Eastern Bengal it frequents small village ponds and roadside ditches as well as the huge areas of open swamp and lake. In the former it will only be found singly or in pairs but in the larger waters it generally associates in small flocks of five or six to ten, probably family parties only. Occasionally these families collect in larger flocks, but this is exceptional. Their diet in India undoubtedly consists in great part of small fish and fish-fry, though they also feed on insects, larvæ, tadpoles etc. as well as small crustacea and mollusca. One found dead had been choked trying to swallow a freshwater prawn nearly five inches long.

They are wonderfully expert swimmers and divers and will clear a small pond out of fish-fry and tadpoles in a very short time. On land they *can* walk about but are very clumsy and slow and if hurried soon tumble over. Nor can they rise into the air from the land and when rising from the water paddle along the surface for a long distance before they get clear of it. In the smaller ponds they become very tame and confiding but on the bigger pieces of water are wary, wide-awake little birds. Their ordinary note is a low note sounding like the hardly audible creak of a door, but their alarm-note is a sharp "tuit-tuit," whilst they also have the usual rippling courting-note of the smaller Grebes.

Family COLYMBIDÆ.

The Loons or Divers differ greatly from the Grebes in their feet, which are furnished with full webs like that of a duck; the tail consists of 16 to 20 feathers and is less completely concealed than that of the Grebes, whilst the feathers are more developed; the plumage, more especially that on the upper parts, is harder and not so furry as that of any *Podiceps*; the dorsal vertebræ are not anchylosed; the sternum is much longer than in the preceding family; the *spina externa* present but the *interna* absent.

The family contains four species which are found throughout the Northern Hemisphere, one specimen of one species having been recorded from India.

Genus **COLYMBUS.**

Colymbus Linn., Syst. Nat., 10th ed., i, p. 135 (1758).

Type, *C. arcticus* Linn.

Characters the same as those already enumerated for the family.

Colymbus arcticus.

Colymbus arcticus Linn., Syst. Nat., 10th ed., i, p. 135 (1758).

Type-locality: Sweden.

The typical form has a darker hind-neck and nape and smaller white spots on the upper parts than the Eastern bird. It is also much smaller with a very small bill.

(2293) Colymbus arcticus suschkini.

THE SIBERIAN BLACK-THROATED DIVER.

Urinator arcticus suschkini Sarudny, Orn. Mitt., p. 111 (1912) (Russian Turkestan).

Vernacular names. None recorded.

Description.—Breeding plumage. Whole upper part of head, sides of upper neck and whole hind-neck dark grey; chin, throat and fore-neck black; a line of white streaks across the lower throat; a diagonal line down the side of the neck, almost joining the base of the hind-neck, of black and white streaks; upper plumage and wings black; a band down each side of the upper back of interrupted white bars; a similar broader band down the scapulars; wing-coverts with two white subterminal spots; sides of upper breast and upper breast just next the black fore-neck streaked black and white; axillaries and under wing-coverts white; flanks black; remainder of lower plumage white.

Colours of soft parts. "Iris red in adults, red-brown in young; bill in winter pale grey (juv. paler, more bluish-white), ridge of upper mandible blackish-slate, extending over sides to nostrils, tip horn-colour; bill in Summer blacker; legs and feet (ad.) outside nearly black, inside very pale grey: webs same with flesh-coloured centres; (juv.) paler, outside dusky, inside milky blue-white." (Witherby for *C. arcticus arcticus.*)

Measurements. Wing 290 to 304 mm.; tarsus 67 to 72 mm.; tail 57 to 58 mm.; culmen 50 to 55 mm. There are few adult specimens of this race in the British Museum collection.

Winter plumage. Head not so pure a grey and becoming brown on the upper sides and the base of the neck; upper parts brown, becoming almost black on the lower back and the ends of the scapulars; wings only sparingly spotted with white; a few white spots on the scapulars showing where the bands come in Summer plumage; an indication of a brown line across the lower throat, sides of shoulders next to upper breast streaked brown and white; a black line across vent; rest of lower parts white.

Nestlings in down of *C. a. arcticus* are dark mouse-brown, the breast and abdomen paler or nearly white.

Young birds are more brown, less grey than adults; the feathers of the mantle have ashy-grey edges, which are obsolete or faint on the rump and upper tail-coverts; sides of the neck more mottled and streaked brown than in the adults; black lines on the under tail-coverts more conspicuous and brown throat-line more definite.

Distribution. Breeding from the Urals to Lake Baikal and the Yenesei, Turkestan and the Kirghis Steppes.

This Diver has once been recorded in India, Mr. A. E. Jones having shot a young female on February 19th, 1922, on the Western Jumna Canal at Jagadhri, Ambala District, Punjab. Mr. Jones records the wing of this bird as only 290 mm., very small for this species and possibly that of a not fully-grown bird.

Nidification. I can find nothing on record about the nidification of this Diver but in a collection of eggs made by Emile Smirnoff in Siberia there are two eggs marked "*Colymbus septrionalis*, 27. 7. 21, Siberia, Trachansk, *insula* Dueson." These are much too big for the Red-throated Diver and are probably those of this race of the Black-throated Diver. They measure 82·1 × 51·4 mm. and

81·7 × 52·0 mm. Their colour is a dark brown and they are sparsely spotted and blotched with black and with a few secondary blotches of inky-grey.

Habits. Apparently similar to those of the Common Black-throated Diver. This latter Diver keeps much to small lochs and lakes in moors and heather-covered hills, feeds almost entirely on fish and is extremely shy and wary. The call is a loud, prolonged wail, audible at an immense distance, whilst they also have a hoarse croak of alarm.

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